School Shop

FOR INDUSTRIAL ARTS & VOCATIONAL EDUCATION TEACHERS

vol. V no. 1
September, 1945

Films for Shop Training —Part I.
by Floyde E. Brooker

Fruit Juice Extractor
by S. L. Coover

How to Start the Year Off Right
by Einar E. Siro

Introducing Ceramics in the School Shop
by Edgar H. Strong

On the cover: Close-up of rough turning operation in a film on lathe work. See page 7 for a description of the value of using films in shop training.

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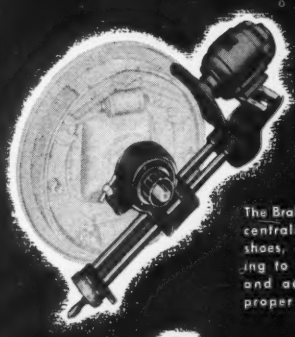

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Planned for future issues of SCHOOL SHOP are two more articles in the series on visual aids by Floyde Brooker, a description of teaching mass production technics in the industrial-arts shop, aviation education programs, and the usual carefully selected project articles and regular monthly features such as School Shop Kinks, News from Industry, Instructional Resources, and from Washington.

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School Shop

FOR INDUSTRIAL EDUCATION TEACHERS

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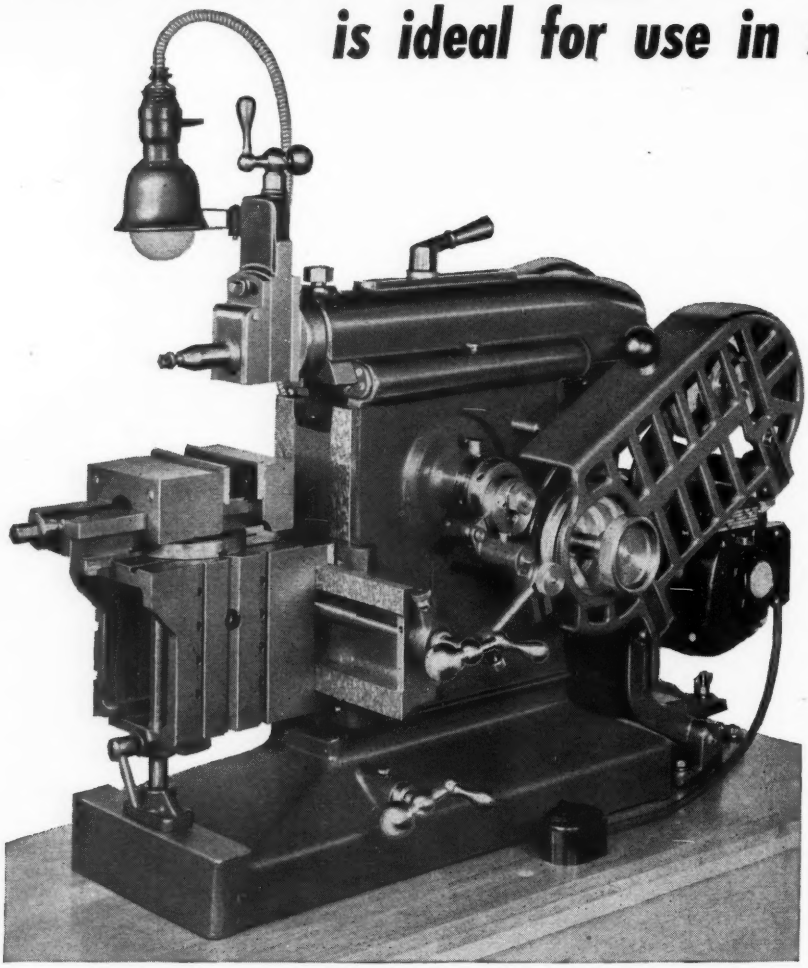

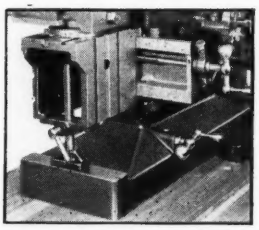

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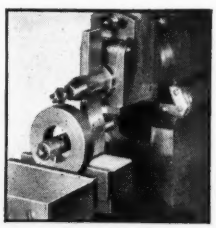

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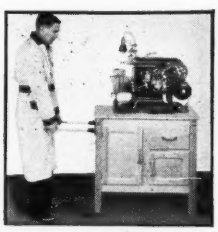

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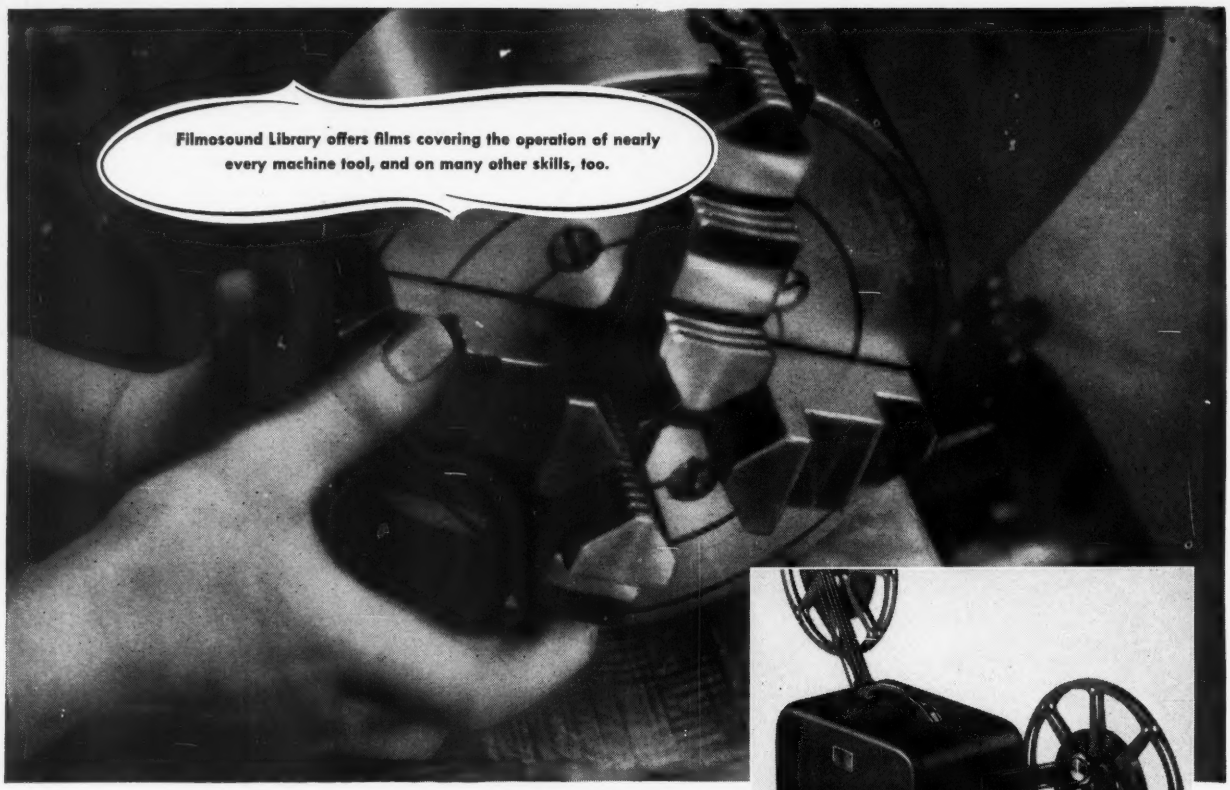

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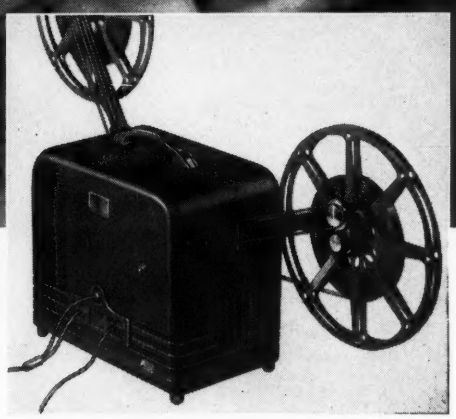

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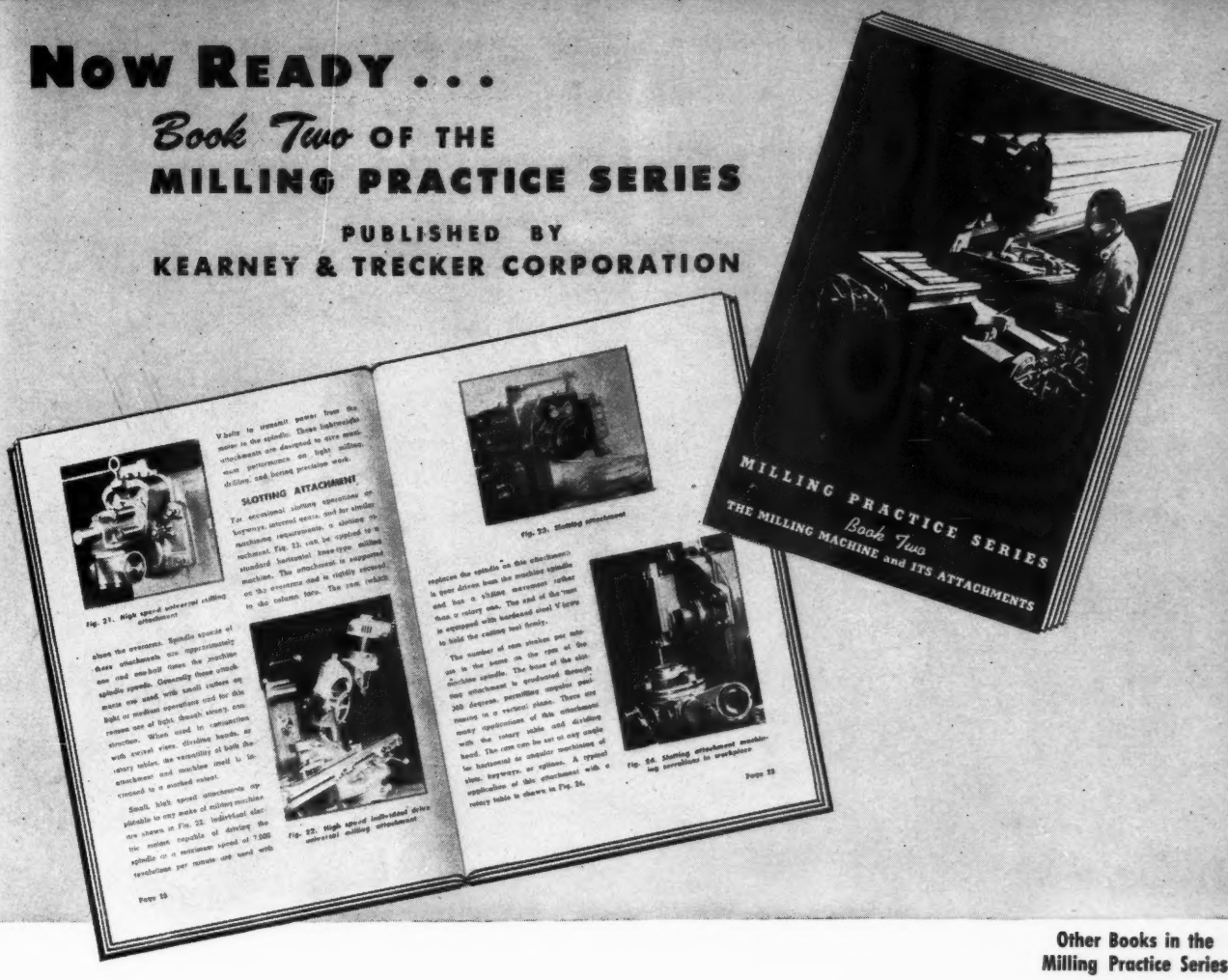

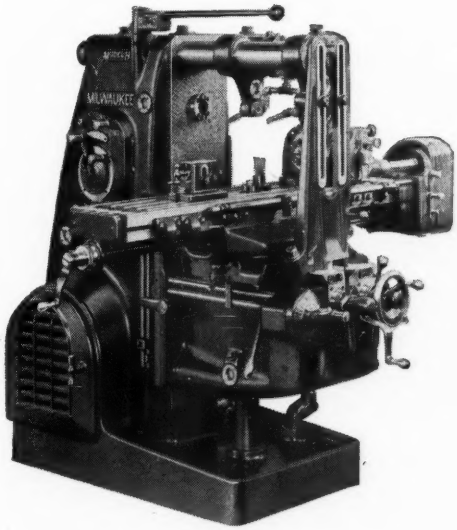

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Films for Shop Training

Part I—For Skeptics Only

BY *Floyde E. Brooker*

The phenomenal success of the armed forces and the war-production training program in using visual aids makes imperative the careful study of this type of instructional device by all shop teachers and supervisors. SCHOOL SHOP asked Floyde E. Brooker, Director, Visual Aids for War Training, U. S. Office of Education, to prepare this series of articles describing the use of films in shop training because his experience in both the production and use of visual aids in shop training is without parallel. Part II in the series, "Forewarned Is Forearmed," will deal specifically with problems encountered in using films while Part III, "This Is How It's Done," will cover suggested technics for utilizing films for maximum instructional value. Part II and Part III will be carried in subsequent issues of SCHOOL SHOP.

THE extensive use of films in the training of the armed forces now on the field of battle marks one of the most significant experiments undertaken by a nation. The success that attended the use of films in this training is acclaimed by the Armed Forces and is attested by the speed and effectiveness with which butchers, bakers, and candlestick makers have been turned into competent soldiers and sailors. The greatest contribution of World War II to education may prove, in the long run, to be an increased understanding of the role and importance of films in training.

Certainly the success with which films have been used in war training has led to the production of a library of films unequalled in its coverage of large areas of vocational training. Each of these films was specifically designed to assist and to expedite training. The Armed Forces and the U. S. Office of Education have produced literally hundreds of specialized films in the specific skills of war and in machine-shop work, shipbuilding, aircraft production and maintenance, truck care, welding, electric work, patternmaking, woodworking, engineering, nursing, and allied skills. For the first time there is a library of films available to the vocational instructor specifically produced to meet his needs.

The constantly increasing interest among vocational instructors in the use of films in their own shop training indicates an alert recognition on their part of the lessons learned during the war period. One of the most common questions being asked by training instructors is, "How do you use films effectively in training?" It is of the utmost importance to the future development of films in training that this question be answered as fully and as completely as possible.

One way of answering would be to supply the instructor with a list of "do's and don'ts" or with some other numbered series of points to remember and to keep in mind. These things are common and undoubtedly have some value. It should be kept in mind, however, that it is doubtful whether any student could be taught to operate a lathe proficiently on the basis of such meager guidance, and certainly, learning how to operate a lathe well is no more complex or difficult than learning how to use a film skillfully and effectively in training. Indeed, an instructor who wishes to learn how to use films effectively in training should adopt for himself very much the same approach he would adopt in preparing a student to learn how to operate a lathe.

Perhaps the total situation in which we find ourselves can be better understood if we recall the development of the automobile around 1908. Men had been able to do all they wished or thought they needed to do by means of already existing modes of transportation. The automobile was a new "fandangled" contraption that broke down frequently, wasn't much faster than a horse, was very expensive, and couldn't do much that horses weren't already doing very satisfactorily. There were the usual extremists on the one hand who claimed that the automobile would never be anything more than a rich man's gadget and those on the other hand who claimed that the automobile eventually would do away with the horse entirely.

The use of films in training today, in comparison with the traditional and existing methods of instruction, may be aptly likened to the use of the automobile around 1908. Pretty much the same things can be said about films now. They are expensive, they break down at times, our schools were not built with their use in mind, and they are a little difficult to learn to use. Quite satisfactory training has been carried on in schools with existing methods of instruction; films in their present form do not add much that is discernible to instruction and they are considerable bother to use. There are also the extremists on both sides who denounce films as a gadget on the one hand and who claim films eventually will eliminate instructors on the other.

But the men who learned to use automobiles effectively in the first decades of the century have lived to see the automobile change almost every aspect of life and to add to the progress of mankind. We know today that neither of the extremists of that day proved to be wholly correct in his estimate. The experience of the war period supports the belief that the instructors who learn now to use films effectively in training will learn how to make their training more effective and will live to see the use of films effect changes in every aspect of education comparable to the changes effected in our living by the advent of the automobile.

The men in the early decades of the century who had used horses all their lives but decided to buy a car faced certain difficulties. It was hard to switch from shouting "Giddap" to starting the car by setting the spark, gas, clutch, and brake, and then whirling the crank. Different principles and skills were involved. The men in those days could not have learned to operate the automobile by any short list of "do's" and "don'ts" or any other over-simplified listing of key points. They had to develop an understanding of the basic principles involved, learn by trial and error, by figger'n' it out the hard way—by experi-

ence. In the simplest terms, men accustomed to driving a horse could not operate a car without additional training, and, because there were no classes, they had to train themselves.

The same thing is true today of the use of films in training. Films and motion pictures as instructional devices are complex in both their purely mechanical aspects and in their educational implications. They do their work in quite a different way from textbooks, lectures, and demonstrations. We cannot organize classes for instructing the present-day vocational instructors in the use of films, or at least we have not. Therefore, each and every instructor must train himself.

The purpose of this article is not to teach how to use motion pictures effectively, but to provide the alert instructor, skilled in present technics of instruction, with an understanding of the basic principles involved so that he may practice their use in his own training work and, by experience, train himself. Just as reading a book never made a lathe operator or a good automobile operator, so just reading this article will not produce an instructor skilled in the use of films.

Successful selftraining requires (1) an understanding of the advantages to be gained; (2) an understanding of the problem; and, finally, (3) an understanding of the basic principles involved and their application. The remainder of this series of articles will be devoted to a discussion of these three points with emphasis being given to the second and third points.

The Advantages of Using Films

Unless an instructor understands what films can do in training, he will lack the goal necessary to guide his own experience and the standard by which he can evaluate his own use of films.

It should be noted here that the U. S. Office of Education has developed the visual aids unit which consists of a sound motion picture, 12 to 17 minutes long, a select filmstrip of 40 to 60 frames, and an accompanying instructor's manual. This forms a package of instructional materials in visual form on a given area of subject matter since each—the motion picture, the filmstrip, and the manual—is intended to supplement the other. The following discussion limits itself to the motion picture and to the filmstrip as indicated.

Since films communicate most of their ideas through the use of pictures which may or may not be accompanied by words printed on the film itself or spoken by a commentator and timed to the picture, they really constitute another form of language. This fact has two implications for the instructor that, once understood, will eliminate many of the existing misconceptions regarding films.

First, it should be understood that films are tools of instruction. As such they have all the advantages and limitations usually found in tools. They have to be *used* in order to do their work; they do not *work* themselves. *Furthermore, good films in the hands of a good instructor, like good tools in the hands of a skilled craftsman, provide the best combination for enabling both tool and person to make the maximum contribution.* In other words, films cannot replace instructors.

Effective films have all the specificity of effective tools. No single screwdriver can be used to tighten all the screws that have to be tightened—every screwdriver has a limited range of usefulness and the same thing must be said about effective films. The most effective films are those that serve a single educational objective. Like good tools, good films can help the poor instructor do a better job, but neither the tool nor the film can by themselves train the instructor. Screwdrivers can be used as chisels and as small crowbars, and films can be used to "fill in" on an "off" afternoon, but neither does a very good job when used this way, for neither was made for this purpose. Like tools, films require an instructor to determine which one should be used, when it should be used, and how it should be used. Like good tools, good films are precision made by skilled workers using quality materials and require a skilled individual to recognize and appreciate their quality.

Secondly, films are a medium of communication. They communicate their messages largely by pictures. The desirability of their communication and the effectiveness with which they make their communication are things to be judged apart from the film medium itself. Motion pictures or filmstrips per se have little value and to use a film simply because it is available is like using a textbook simply because it is handy. Also to condemn the use of films in training because you have seen ineffective or poor films is like condemning the English language because you have read a paragraph containing misspelled words or improper punctuation.

As instructional tools conveying their message via pictures, films, if they are properly made and properly used, can do many things to assist the instructor. Indeed, they can do some things the instructor by himself cannot do. This should not be surprising; we have screwdrivers because they can turn a screw better than a pocket knife or finger nails. The advantages of films are known through some research, but even more through the observations of shop instructors who have used them both in schools and in industrial training groups. The reports of these people can be summarized very briefly as follows:

1. Films can speed up training. Some Army estimates run as high as 40 percent, some industrial leaders say as high as 75 percent. Depending on the subject and period over which the films are judged, it should run from 15 to 50 percent.

2. Facts learned from films are retained or remembered longer. Research in this area indicates that the retention of facts learned from films is 55 percent better than when learned in other ways.

3. Films standardize training. Observations on this point are unanimous, but no definite data are available.

4. Film use may make the total training better and more effective. Sometimes the increased effectiveness of films is used not to shorten the period of time required for training but rather to provide better training.

5. The use of films secures better attention and holds the interest of the class. A number of observations on this point attest the fact that classes trained by films have had less absenteeism and greater promptness in attendance during the war period.

In addition to these reports of observations, the following advantages of using films should be noted:

The film demonstration can be definitely superior to the average class demonstration because:

A group of students can see what is being done with equal clarity and from the identical viewpoint;

The motion picture permits complete control of the time needed and can slow down important operations or speed up the operations of little learning value;

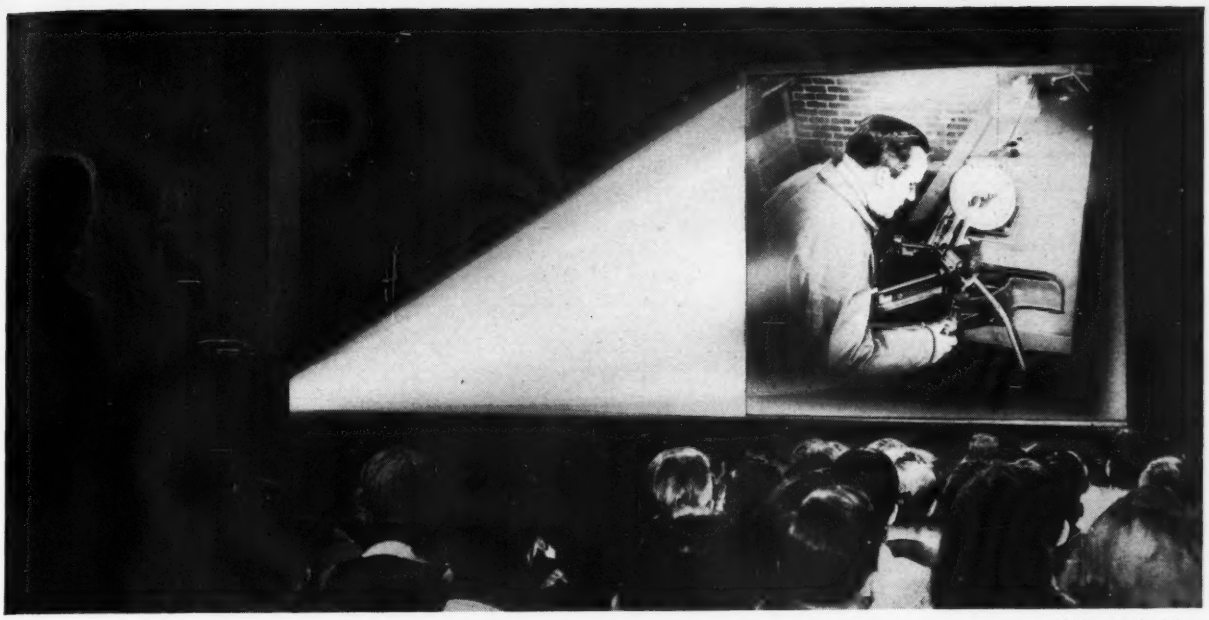
The motion picture permits the elimination of all extraneous noises and all views of the machine except the exact part in which the students are interested;

The selection of scenes, the words used, and their organization are the result of hours of painstaking care by outstanding authorities—far more time and care than the average instructor can spend organizing a single demonstration;

The demonstrator in the film has been selected for his skill; he never grows cross or irritated at doing the same demonstration over and over, never forgets a single line or action, but always repeats the demonstration exactly as it was done the first time;

Animation can explain the action and the basic principles in the demonstration at the time those principles need explanation, using a technic of explanation that is superior to all others;

It can be repeated for the slow student, for



Courtesy Castle Films

"Screwdrivers can be used as chisels and as small crowbars and films can be used to 'fill in' on an 'off' afternoon, but neither does a very good job when used this way, for neither was made for this purpose. Like tools, films require an instructor to determine which one should be used, when it should be used, and how it should be used. Like good tools, good films are precision made by skilled workers using quality materials and require a skilled individual to recognize and appreciate their quality."

the student absent the day of the first showing, without requiring the full time of the instructor or of the class and without embarrassment to the individual or group using it;

The film demonstration possesses an objectivity unattainable by the usual instructor demonstration. Students can learn and know without having to admit that they didn't know. This is particularly important in the training of women or in the training of individuals who have had some experience;

The film demonstration provides a way of giving school shop students a degree of familiarity with production machines that they do not possess in the school shop. This has proved of considerable assistance to students going from the school into production shops.

We do not yet know enough about motion pictures to be able to say completely just what they do and can do. Each instructor who is alert and interested in this problem undoubtedly will find other values he can add to this list. Perhaps all the values that we have discovered in the use of films in training may be summarized in the following quotations made by men who have used films:

John M. Amiss, Director of Industrial Education, Chrysler Corporation:

Recently, as an experiment, one of our instructors called in ten new apprentices who did not know how to read a micrometer. He merely showed the micrometer film twice to the group without any explanation or discussion whatever. He then brought in some micrometers and test blocks and had the group use the micrometers. Only one of the group tested was unable to use the micrometer as required. This illustration of the practicability of your films is, of course, extreme; we would not teach the use of the micrometer in that manner but it certainly shows that the films are doing everything and more than is claimed for them.

All of us acquainted with the films are as enthusiastic about them now as when we first used them. In fact we are going out to the schools showing the films. In cases where the schools do not have the projector we take along a projector.

Your films speed up training considerably; we are not prepared to give any percentage of increase in speed because we have not made such tests. We consider them to be based on sound mechanical and educational theory and practice.

G. H. Parkes, Director, Williamsport Technical Institute:

You will be interested to see our use of the machine-shop films. We are so impressed by these teaching aids that we are setting up a full-time projection room in our machine shop and expect to show these films continuously for at least one shift and perhaps three full shifts.*

William F. Cline, Project Supervisor, Vocational Training for Defense Work, Department of Education, West Virginia:

During the month of April, our projector was out of order and about 60 new trainees who were assigned to machine-shop training did not see the pictures. During May, their second month of training, the shop instructors complained that it was the poorest group of trainees that they had had. Early in May the projector was repaired and the Office of Education films were again shown on regular schedule. The instructors commented on the speed at which the training improved.

*For a description of this projection room and visual-aids program see the November, 1942, SCHOOL SHOP, page 8.

Comments of both trainees and instructors indicate that the films are extremely valuable. They speed up the rate of learning by presenting ideas in a concise, interesting way. They develop better comprehension by showing and explaining at the same time. They are particularly valuable for supplementing a shop instruction program where the emphasis is on rapid training.

Few shop instructors will or should use films solely on the basis of what has been reported about them. The proof of any pudding remains in the eating. The same is true of films. See some of them, enough to provide a fair sample of the films available for shop training, view them with an open mind, and then decide for yourself whether or not there would be any advantages whatsoever in using them. Try them in your own class with an open mind and pass your own judgment. If you are convinced, the statement in next month's issue of SCHOOL SHOP of some of the problems met in using them may prove of value.

More coming on films by Floyde E. Brooker:

In October, **"Forewarned Is Forearmed"**—how to meet common problems in the use of films.

In November, **"This Is How It's Done"**—helpful technics in film use.

Watch for them!

Fruit Juice Extractor

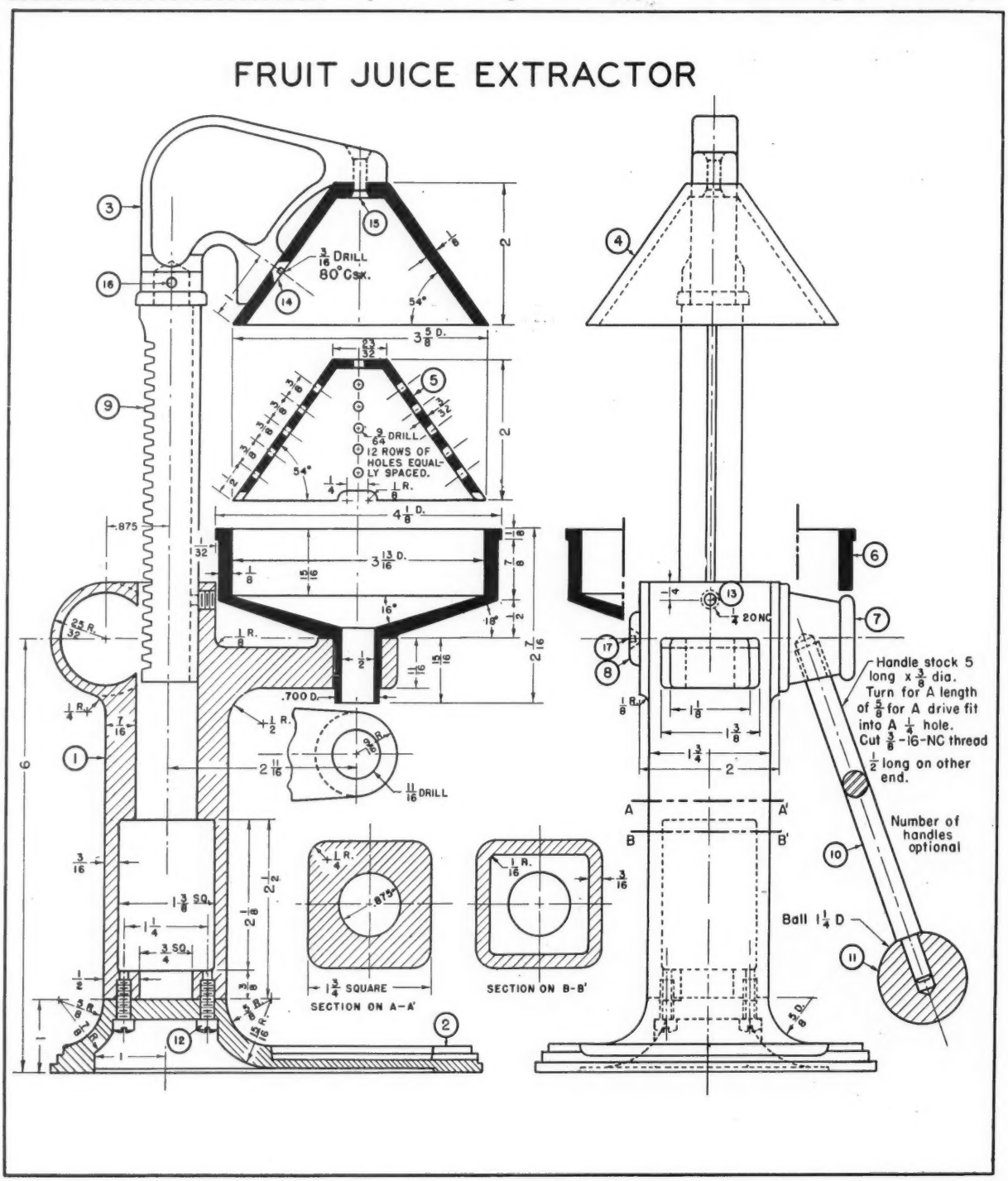
BY *S. L. Coover*

The instructional potentialities of this superior machine-shop project are unique as any good instructor will readily recognize. S. L. Coover is Director, Department of Industrial Arts, State Teachers College, California, Pennsylvania.

TESTED INSTRUCTIONAL PROJECT

THE fruit juice extractor is one of the most satisfactory machine-shop projects we have ever made. Not only is the completed juicer a valuable and useful piece of kitchen equipment, but its manufacture requires a wide range of unusual operations such as spur-gear cutting, rack cutting, plain turning, taper turning, taper boring, plain boring, indexed drilling, drive fits, bearing fitting, taper-pin reaming and fitting, the turning of a sphere, and other processes.

As a matter of fact, we use this project to introduce students to the complete manufacturing cycle which, incidentally, The manufacturing cycle includes plan-


FRUIT JUICE EXTRACTOR
3 5/8 D.
4 1/8 D.
3 13/16 D.
.700 D.
.875
54°
16°
18°
12 ROWS OF HOLES EQUALLY SPACED.
3/16 DRILL 80° CSK.
9/64 DRILL
11/16 DRILL
1/4 - 20 NC
Handle stock 5 long x 3/8 dia. Turn for A length of 5/8 for A drive fit into A 1/4 hole. Cut 3/8 -16-NC thread 1/2 long on other end.
Number of handles optional
Ball 1 1/4 D
1 3/4 SQUARE
SECTION ON A-A'
SECTION ON B-B'

ning, sketching, drawing, tracing, blueprinting, wood and metal patternmaking, core making, casting, machining, and finishing.

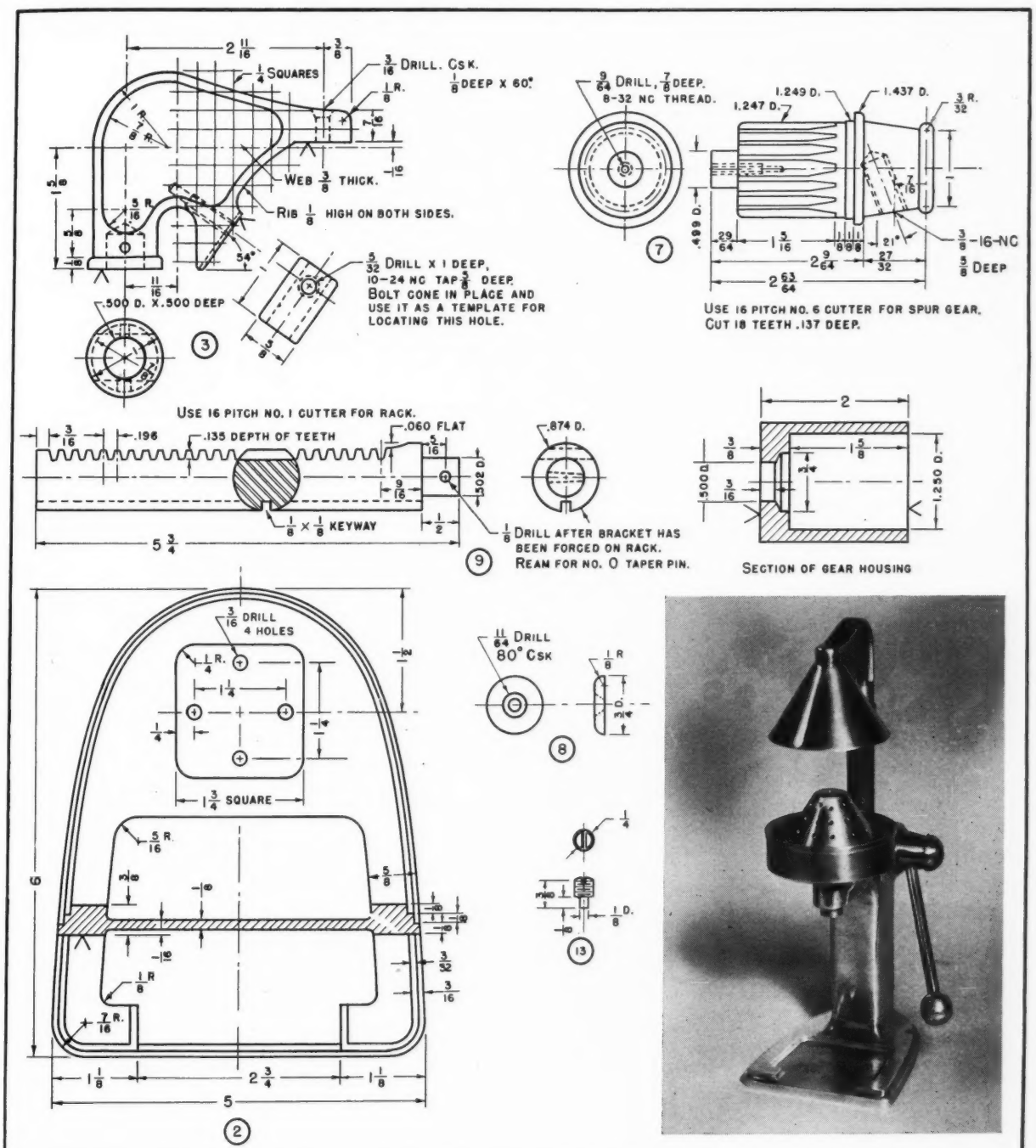
All that is needed for making the aluminum castings is a gas soldering furnace or a forge and a small ladle. Aluminum melts at 1200° F and pours best at 1400° F. Albany No. 00 moulding sand is the correct grade to use for smooth casting. Scrap aluminum cylinder heads and pistons make excellent castings which are rigid and hard enough to machine well.

With the possible exception of the cup (part 6), the casting operation should offer no particular difficulty. Fill the drag with sand and allow it to sift into the cup. Press the sand down with

(Continued on page 13)

BILL OF MATERIALS

No.	Size and Name	Req'd.	Mat.	No.	Size and Name	Req'd.	Mat.
1.	Frame casting	1	Al.	10.	Handle	1	Steel
2.	Base casting	1	Al.	11.	Handle knob	1	Al.
3.	Bracket casting	1	Al.	12.	10-24 x 5-8 fil. hd. screw	4	Steel
4.	Top cone	1	Al.	13.	Headless slotted set screw	1	Steel
5.	Strainer cone	1	Al.	14.	10-24 x 5-8 flat hd. screw	1	Steel
6.	Cup	1	Al.	15.	3-16 x 3-4 cask. rivet	1	Al.
7.	Spur gear	1	Steel	16.	No. 0 taper pin	1	Steel
8.	Spur gear cap	1	Steel	17.	8-32 x 1-2 flat hd. screw	1	Steel
9.	Rack	1	Steel				



Inventory Before Teaching Drafting

BY *Floyd C. Allison*

That old bugaboo of individual differences raises its head with every new class. Floyd C. Allison, Head of the Drafting Department, Munger Junior Trade School, Detroit, Michigan, has developed a series of inventories that have proved of value in developing teaching content that meets the real needs of the student. These are not tests but instructional aids for both teacher and student. A few examples are reproduced with the article to show how the inventories are constructed.

RECORDS of vocational schools show a wide variation in the background, ages, and grade achievement of entering students in mechanical drawing. A still wider range of differences exists in adult evening and war-production training groups. This makes it necessary to evaluate each individual's grasp of the fundamentals in order to teach effectively.

A plan has been derived to promote growth and experience by checking a systematic inventory of items, including knowledge of drafting fundamentals, ability to put drafting fundamentals into concrete form, and ability to associate drafting fundamentals with shop technology.

The inventories presented here, along with a number of others covering different items, have been effective in providing the instructor and student with two sets of information in graphic form —what the individual knows and what he does not know about the subject. They also show, somewhat crudely perhaps, what he can do. Although set up in a test form, these inventories are used (singly or as a whole) to discover what place the student has reached in his command of drafting fundamentals. He will then have determined what items his study should begin with and items that must be included to complete the assignments. The inventories are not tests; therefore, scores are not essential.

The following procedure has been used in interpreting results of the inventories.

Each entering student is given one inventory at a time or, if feasible, the entire group. The student is directed to fill in all answers that he can. He is instructed to time his work, if he desires, but to allow enough for careful answers. Speed is not essential. Since students enter classes at any time, the inventories are used without reference to the beginning of the term.

When each inventory is complete, all items are checked by another student and those *missed or left unanswered* are red-penciled.

The results are recorded on the bottom of each page in the spaces provided for this purpose.

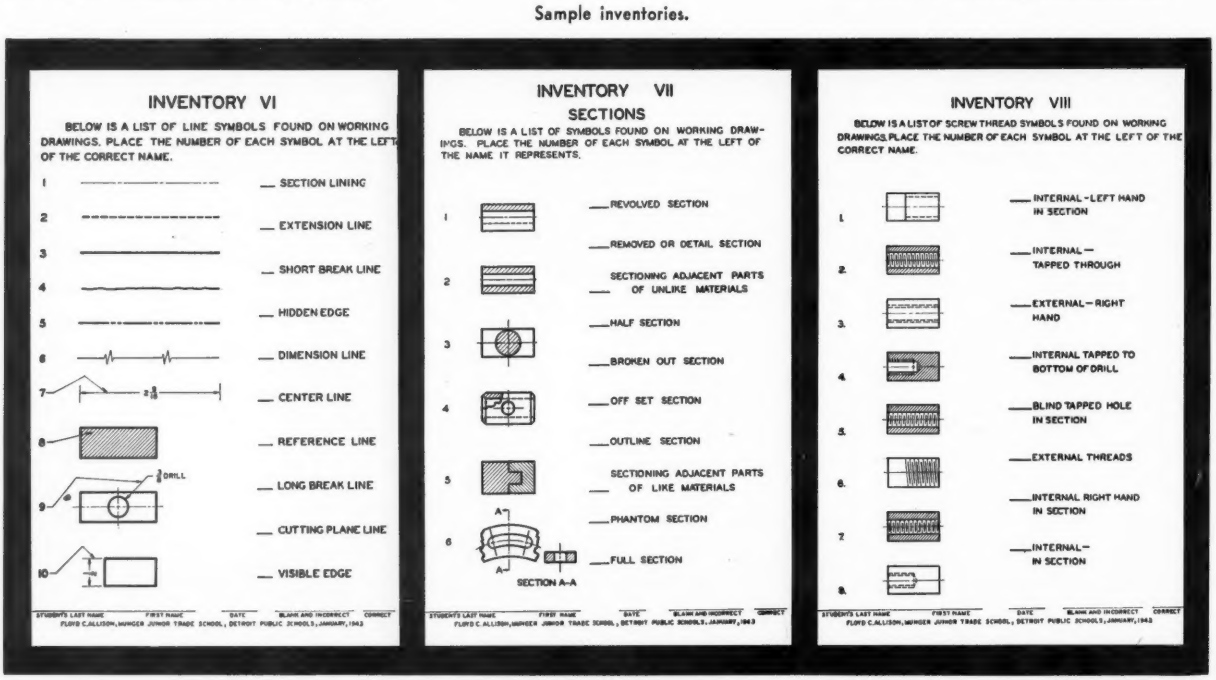
Correct answers are interpreted on the inventory chart with red check marks. Unchecked spaces show what the student must learn. The lacks shown serve as a basis for instruction.

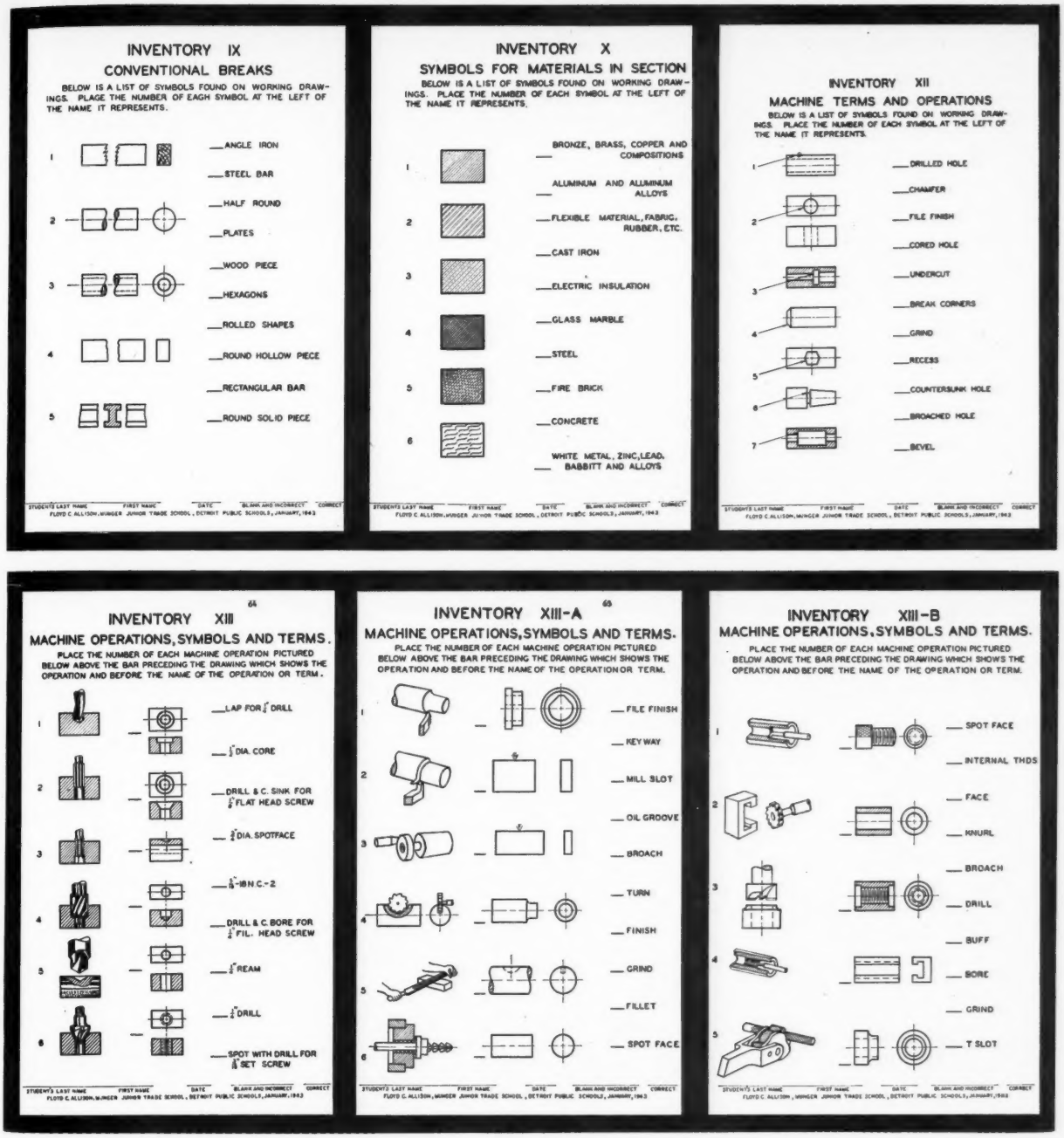
Interpreting what the inventory chart shows: Does the student *know*? Can he *do*—make drawings and use shop information? Can he *associate* what he sees on a drawing with its function in the shop? The unchecked spaces show both the instructor and student what must be covered in drafting assignments and will also reveal to the student and instructor the grasp (or absence of it) the student has of the relation of the drawing to shop practice.

Subsequent entries made on the inventory summary in other colors will enable the student as well as the instructor to note individual progress.

The instructor and the student both benefit from these findings. The instructor will not overestimate or underestimate the knowledge and achievement of entering students. Individual students begin and proceed in their study of mechanical drawing with concrete evidence of achievement and needs. The inventories furnish a realistic, dependable means of interrelating knowledge, skills, and uses of drafting fundamentals.

Sample inventories.


INVENTORY VI
BELOW IS A LIST OF LINE SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE CORRECT NAME.
1 — SECTION LINING
2 — EXTENSION LINE
3 — SHORT BREAK LINE
4 — HIDDEN EDGE
5 — DIMENSION LINE
6 — CENTER LINE
7 — REFERENCE LINE
8 — LONG BREAK LINE
9 — CUTTING PLANE LINE
10 — VISIBLE EDGE
INVENTORY VII
SECTIONS
BELOW IS A LIST OF SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE NAME IT REPRESENTS.
REVOLVED SECTION
REMOVED OR DETAIL SECTION
SECTIONING ADJACENT PARTS OF UNLIKE MATERIALS
HALF SECTION
BROKEN OUT SECTION
OFF SET SECTION
OUTLINE SECTION
SECTIONING ADJACENT PARTS OF LIKE MATERIALS
PHANTOM SECTION
FULL SECTION
SECTION A-A
INVENTORY VIII
BELOW IS A LIST OF SCREW THREAD SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE CORRECT NAME.
INTERNAL - LEFT HAND IN SECTION
INTERNAL — TAPPED THROUGH
EXTERNAL — RIGHT HAND
INTERNAL TAPPED TO BOTTOM OF DRILL
BLIND TAPPED HOLE IN SECTION
EXTERNAL THREADS
INTERNAL RIGHT HAND IN SECTION
INTERNAL — IN SECTION


INVENTORY IX
CONVENTIONAL BREAKS
BELOW IS A LIST OF SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE NAME IT REPRESENTS.
ANGLE IRON
STEEL BAR
HALF ROUND
PLATES
WOOD PIECE
HEXAGONS
ROLLED SHAPES
ROUND HOLLOW PIECE
RECTANGULAR BAR
ROUND SOLID PIECE
INVENTORY X
SYMBOLS FOR MATERIALS IN SECTION
BELOW IS A LIST OF SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE NAME IT REPRESENTS.
BRONZE, BRASS, COPPER AND COMPOSITIONS
ALUMINUM AND ALUMINUM ALLOYS
FLEXIBLE MATERIAL, FABRIC, RUBBER, ETC.
CAST IRON
ELECTRIC INSULATION
GLASS MARBLE
STEEL
FIRE BRICK
CONCRETE
WHITE METAL, ZINC, LEAD, BABBITT AND ALLOYS
INVENTORY XII
MACHINE TERMS AND OPERATIONS
BELOW IS A LIST OF SYMBOLS FOUND ON WORKING DRAWINGS. PLACE THE NUMBER OF EACH SYMBOL AT THE LEFT OF THE NAME IT REPRESENTS.
DRILLED HOLE
CHAMFER
FILE FINISH
CORED HOLE
UNDERCUT
BREAK CORNERS
GRIND
RECESS
COUNTERSUNK HOLE
BROACHED HOLE
BEVEL
INVENTORY XIII
MACHINE OPERATIONS, SYMBOLS AND TERMS.
PLACE THE NUMBER OF EACH MACHINE OPERATION PICTURED BELOW ABOVE THE BAR PRECEDING THE DRAWING WHICH SHOWS THE OPERATION AND BEFORE THE NAME OF THE OPERATION OR TERM.
LAP FOR ⅝" DRILL
⅝" DIA. CORE
DRILL & C. SINK FOR ⅜" FLAT HEAD SCREW
¾" DIA. SPOTFACE
⅝"-18 N.C.-2
DRILL & C. BORE FOR ⅜" FIL. HEAD SCREW
⅝" REAM
⅝" DRILL
SPOT WITH DRILL FOR ¼" SET SCREW
INVENTORY XIII-A
MACHINE OPERATIONS, SYMBOLS AND TERMS.
PLACE THE NUMBER OF EACH MACHINE OPERATION PICTURED BELOW ABOVE THE BAR PRECEDING THE DRAWING WHICH SHOWS THE OPERATION AND BEFORE THE NAME OF THE OPERATION OR TERM.
FILE FINISH
KEY WAY
MILL SLOT
OIL GROOVE
BROACH
TURN
FINISH
GRIND
FILLET
SPOT FACE
INVENTORY XIII-B
MACHINE OPERATIONS, SYMBOLS AND TERMS.
PLACE THE NUMBER OF EACH MACHINE OPERATION PICTURED BELOW ABOVE THE BAR PRECEDING THE DRAWING WHICH SHOWS THE OPERATION AND BEFORE THE NAME OF THE OPERATION OR TERM.
SPOT FACE
INTERNAL THDS
FACE
KNURL
BROACH
DRILL
BUFF
BORE
GRIND
T SLOT

Juice Extractor *(from page 11)*

your hand, but do not pack it too tightly into the cup. Rap the cup lightly, covering it with a piece of sheetmetal, then turn it over and place it on the center of the drag. Place spruce pins, fill cope, and proceed as usual. When the cope is removed, the green sand core which hollows out the inside of the cup should remain on the drag, while the pattern should stay in the cope.

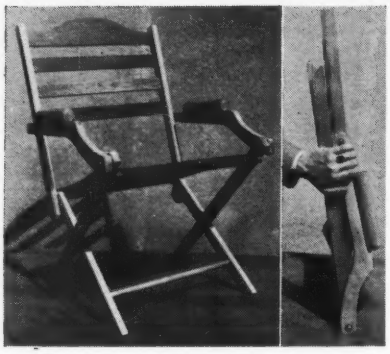
Point out to the patternmaker that since aluminum shrinks ¼" to the foot, a shrink rule should be used for all pattern measurements. To provide for holding the cone during the machining operations, a small cylinder ¾" in diameter and ¾" long should be cast on the small end of the cones. Both cones are made from the same pattern.

Since the majority of those who make the extractor are apt to be better acquainted with machine-shop operations than with patternmaking and casting, few machining suggestions need be given. Undoubtedly some teachers of advanced machine-shop practice will want to blot out some of the information dealing with gear cutting and allow their students to work out these problems for themselves. The conical bearing surface on the bracket (part 3) where the top cone (part 4) is fastened to it should be machined with a fly or form cutter of the proper radius and set at the correct angle (54°).

As an added operation, some teachers nickel plate or chromium plate the handle, rack, spur gear, and other steel parts to prevent them from rusting. These parts may also be made of stainless steel. The aluminum parts need no finishing other than smoothing and polishing.

Officer's Folding Chair

BY *Hugh A. Baird*



Here is a project with lots of utility that is well within the ability of the average student in woodworking. Hugh A. Baird teaches in the Benjamin Franklin High School, Los Angeles, California.

TESTED PROJECT

THIS folding chair folds to an unbelievably small size. Its value as a woodworking project lies first in its many learning opportunities, second, in the large number of teaching technics involved, and, third, in its definite utility value.

It's a good wartime project because of the small amount of material required and the number of different uses it may be put to.

The basic design follows somewhat the lines of the usual officer's chair, but this particular type folds into a much smaller space. The pictures show the chair open and folded.

The operations involved include careful layout from the blueprint, band sawing, planing, spokeshaving, squaring, drilling, and wood turning, as well as the very careful linkage problem, which is the secret of the folding qualities of the chair.

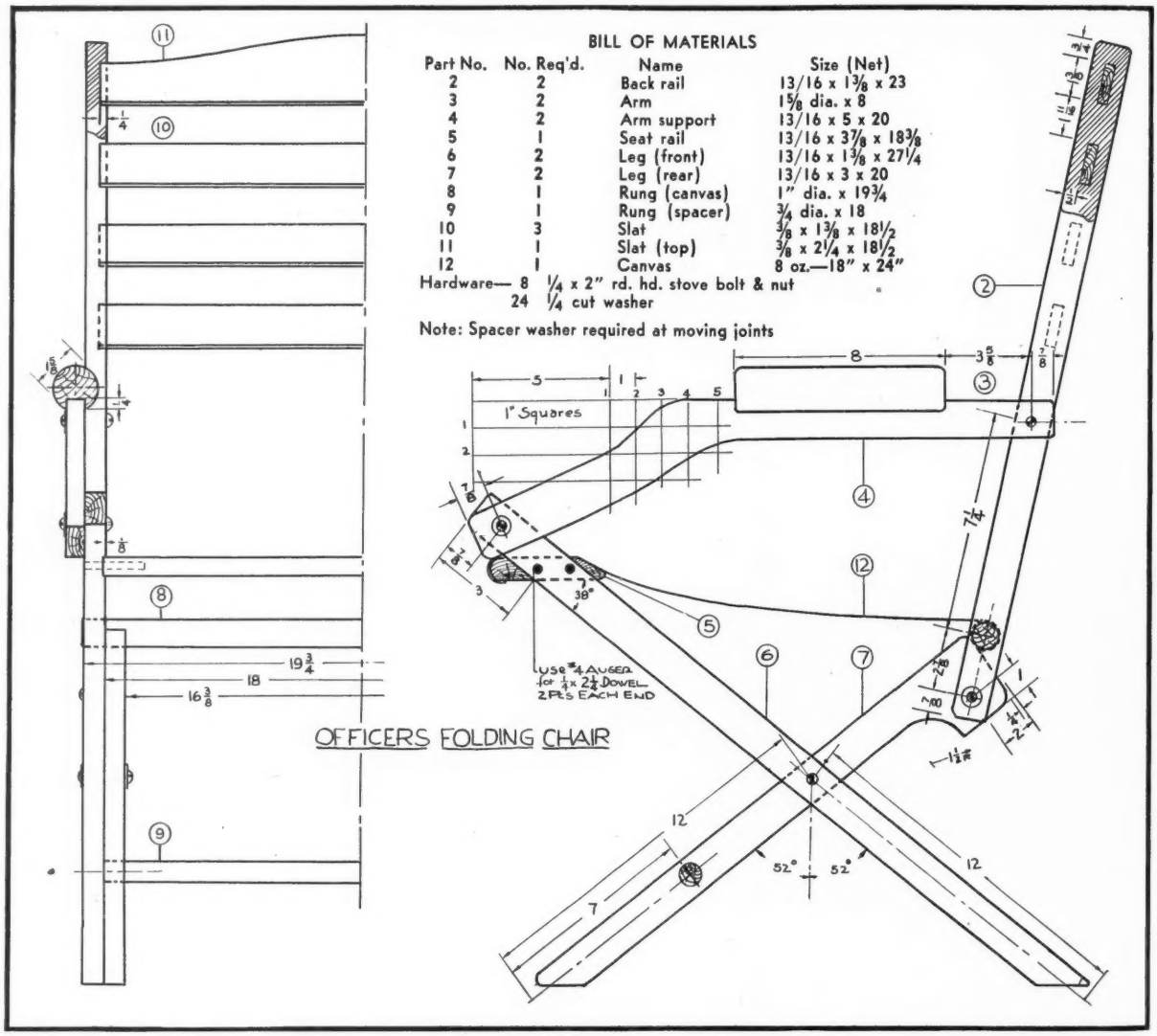
We have made a number of chairs from this drawing and find that they work perfectly. The materials used may include any of the hard woods and many of the strips can be salvaged from scrap material. The canvas color is a matter of choice as is also the painting job. The actual cost of the materials, when made in the school shop, was under $1.

BILL OF MATERIALS

Part No.	No. Req'd.	Name	Size (Net)
2	2	Back rail	13/16 x 1 3/8 x 23
3	2	Arm	1 5/8 dia. x 8
4	2	Arm support	13/16 x 5 x 20
5	1	Seat rail	13/16 x 3 7/8 x 18 3/8
6	2	Leg (front)	13/16 x 1 3/8 x 27 1/4
7	2	Leg (rear)	13/16 x 3 x 20
8	1	Rung (canvas)	1" dia. x 19 3/4
9	1	Rung (spacer)	3/4 dia. x 18
10	3	Slat	3/8 x 1 3/8 x 18 1/2
11	1	Slat (top)	3/8 x 2 1/4 x 18 1/2
12	1	Canvas	8 oz.—18" x 24"

Hardware— 8 1/4 x 2" rd. hd. stove bolt & nut
24 1/4 cut washer

Note: Spacer washer required at moving joints



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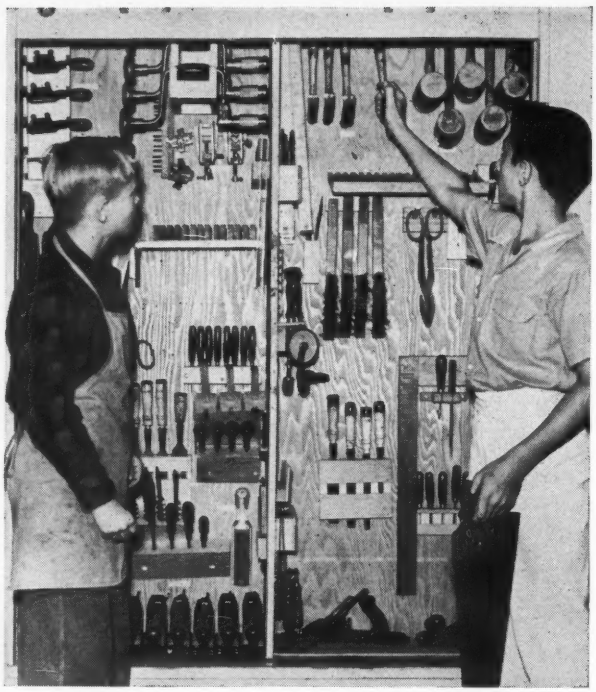
Name of School _____

Street and Number _____ *City and State* _____

How to Start the Year Off Right

BY *Einar E. Siro*

A good beginning is half the battle of a successful year of teaching. Here is a practical guide to starting right. Einar E. Siro is a member of the Teacher Training Department, Armored Force School, Fort Knox, Kentucky, and formerly taught in the public schools of Minnesota.



Having shop equipment in readiness for the first day of work is essential for a good beginning. Note the completeness of the hand-tool equipment in this Los Angeles, California, school shop.

THE shop instructor is confronted with numerous problems at the beginning of the school year, especially if he is taking over duties in a new community. Not only must he concern himself with problems in the shop and the rest of the school but he must also adjust himself to the community. A large degree of his success will depend on the preparation for the tasks ahead.

Particularly in the smaller communities the importance of the instructor's role can not be overemphasized. The instructor is looked on as one of the leaders of the young people. Therefore, it is essential that he orient himself as soon as possible in the community in which he is to work. The size of the community, home background of the students, recreational facilities, and local attitudes toward shop training, as well as the industrial, political, religious, business, labor, and social groups should be considered in making his plans.

The instructor's sphere of interest in the school must not be limited to the industrial department alone. It must include the entire school. The shop teacher must know the objectives of the school and how the work of his department, together with that of other departments, contributes to the realization of these objectives, and he should be able to speak authoritatively of the special contributions made by his department. He must be prepared to take over his share of responsibility for problems which affect the school in general, always remembering that the success of any organization depends upon the full cooperation and contribution of all of its members.

The shop teacher who arrives on the opening day of school without everything in readiness to start the term greatly hinders his own chances of success. The instructor should have a thorough understanding of the objectives of his work, a course of study, shop in condition to start the work with maximum efficiency, and a clear conception of how he is going to proceed when the students arrive. To accomplish this, it may be advisable for him to survey the situation weeks in advance in order to make the necessary plans, order needed supplies and materials, and then arrive on the job a few days before the opening day with a definite plan for readying the shop. Students may in some cases be used to assist the instructor in conditioning tools and equipment, as these activities can make a vital contribution to their training. However, this must not be overdone. Because students are seldom familiar with the shop, their help will necessarily be limited. There is danger of squelching student enthusiasm for the work ahead if they are required to do a lot of cleaning up and conditioning of tools before starting the actual class work. Likewise, students will become disheartened if they are required to wait for the instructor to ready the shop after school begins.

A systematic opening will make teaching easier the rest of the year. The entire first class period must be devoted to orienting the students. If possible, give them an opportunity to engage in some activity in the shop. This may consist of getting acquainted with the shop layout, tools, and equipment or in figuring and getting out material for the first project. In some cases the students may have time to start on their project during the first class period. Routine matters, such as seating students, introducing one's self and taking attendance, should be attended to first. Then a careful explanation should follow regarding the objectives of the course, projects to be made, technical and related information that will be taught, how tools and materials will be issued and checked, purchase of materials students will use, shop rules and the importance of adhering to them—especially safety rules—and the type of foreman or checker system that will be used. If the students understand from the beginning what is expected of them and the instructor sees to it that his expectations are carried out, a well-operated and disciplined shop will result. The instructor's appearance, continuous friendly business-like attitude, firmness, and actions will do much to impress the students with the program and contribute to its success.

The instructor can help insure himself of an efficient start by compiling a list of things he must attend to before the opening day, during the opening day, and days to follow, and then go about systematically taking care of them. The following list contains suggestions that can be used as a guide by the instructor in preparing his lists. Some of the items are in the form of statements of things to do, while others are in question form to start the instructor thinking of a problem in his particular situation and its solution. It is very likely that the instructor will alter his lists as he proceeds with his preparation. After the

TEACH RADIO at low cost with the MEISSNER student kit

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This radio receiver is just as carefully engineered as larger sets. It is disassembled and shipped with detailed, graphic instructions for assembly written in language a 12-year-old can understand. No complicated wiring diagrams. Pliers, screwdriver and a small soldering iron are the only tools you need.

The Meissner Student Kit is the same now used by the U. S. Army Signal Corps for basic radio instruction. As students advance, "add-on" kits can be obtained to convert the 1-tube sets into 2 and 3-tube receivers. Most advanced radio students use the 6-tube, 2-band Kit that is also extensively used by the Signal Corps and the Navy.

To help you teach, the Meissner Manufacturing Company has prepared the Meissner Student Instruction Plan. For detailed information, write to Meissner today. There is no obligation.

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ADVANCED ELECTRONIC RESEARCH AND MANUFACTURE

instructor has prepared his lists it will not be necessary for him to question superiors or fellow teachers for all the answers.

Suggested Information to Gather and Items to Attend to at the Beginning of the School Year

(Listed at Random)

1. How large is the school? How many teachers are there? How many students?
2. What are the objectives of the school? The industrial department? The courses you are going to teach?
3. Who are the administrative and supervisory officers? To whom will you be directly responsible?
4. Is it a general or single-activity shop?
5. Are you the only one who will teach in the shop?
6. Is a course of study available? If not, prepare one.
7. Are you thoroughly acquainted with the subject matter you are to teach? If not, study subject matter and practice to acquire necessary skill.
8. How large are the classes?
9. How are the classes scheduled?
10. What are the school rules and regulations?
11. How are notices handled in the school?
12. Learn all you can about your students. Check office records for age, background, and previous training.
13. How will you take care of individual differences among students?
14. Check shop inventory. If one is not available, prepare one. Keep inventory up to date. Check with superiors.
15. Where are you to buy materials, tools, supplies, and equipment? Local concerns? Bids? Through board of education?
16. Order sufficient supplies and materials. Provide adequate storage space.
17. What is the condition of the power equipment? Check very carefully before turning power on. Operate by hand power first to avoid accidents. Have necessary repairs made.
18. What is the condition of the hand tools? Sharpen cutting tools. Check for loose hammer and mallet handles. Remove spalls or mushroom heads from chisels, punches, and hammers. Are all files provided with handles?
19. Remove rust from tools and equipment.
20. What is the condition of work benches and vises?
21. How are students going to be accommodated in respect to the available tools and equipment?
22. Is there a place for every student to work?
23. Do not be too hasty to make changes in the shop. Appreciate the other man's ideas. They may be best for the situation.
24. What safety rules are you going to establish for the shop? What state and national laws affect you? What safety posters or signs are you going to use?
25. Do you know your responsibility in case of an accident?
26. Are all machines provided with sufficient guards?
27. What is the condition of floors around machines and in the shop in general?
28. Is there a complete first-aid kit? Do you know how to use it?
29. Check capacity of fuses, electric lines, and motors.
30. How are gases and dust removed from the shop? What type of blower system is used?
31. What is the shop budget?
32. How is money for projects to be collected? It is better to have the office handle the money.
33. What is the school policy regarding discipline? Be strict from the beginning. A good shop cannot be run without discipline and order.
34. How are you going to go about familiarizing students with shop rules?
35. What is the school calendar? Schedule work so that holidays will not interfere with progress.
36. What student records are to be kept? Progress charts? Toolroom records? Supply records? Attendance records? Cleanup charts? Accumulative records? Rating charts?
37. Are you going to use a shop foremanship plan? How are students going to be used to help run the shop and keep it clean?
38. What vocational guidance and placement coordination work are you to engage in?
39. What extracurricular activities are you to sponsor or engage in? P.T.A. activities? School auditorium programs? Clubs? Homeroom activities?
40. When and where are staff meetings to be held?
41. Is curriculum revision necessary?

(Continued on page 20)

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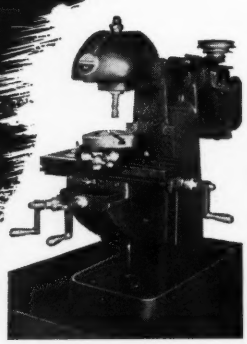
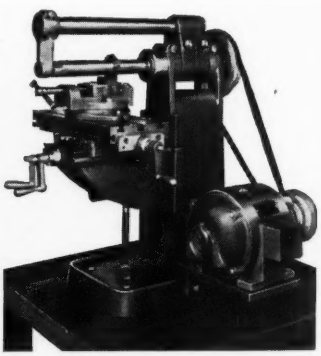


Vertical Mill



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42. Integrate shopwork with other courses.
43. Are you required to turn in lesson plans to superiors?
44. How much are consumer values to be stressed?
45. Will there be adult and part-time classes? Evening school?
46. What stenographic assistance is available?
47. What is your responsibility for securing and registering students?
48. What state reports are required?
49. How much janitorial service will be available for the shop?
50. Strive for good relations with the janitorial and engineering staffs.
51. If production work is required, remember that instruction comes first and production second.
52. Are there sufficient desk supplies (ink, pencils, pens, paper clips, blotter, rubber bands, paper, etc.)?
53. How are the school and shop keys to be handled?
54. What are the policies regarding the use of the shop after hours and on Saturdays?
55. Is the shop to be used by the janitorial staff and other instructors?
56. How are the students to report to and leave the shop?
57. How are transfer students to be handled to and from the school and shop?
58. Stamp or paint shop code on all tools to prevent loss.
59. Check shop and school libraries for material that can be used by you and the students.
60. Advertise the department in the school and local papers, through exhibits, and talks to individuals and groups.
61. When and how are fire drills conducted?
62. What fire prevention precautions are you going to take in the shop? Do you have a metal container for oil and paint rags?
63. How can ventilation, light, and temperature be regulated?
64. How is class time going to be used in relation to shopwork, technical and related information?
65. Is there a display board for sample projects?
66. Are projects designed to help meet the objectives of the course? Are all projects to be assigned or are students allowed to select some?
67. What type of testing program are you going to use? Performance tests? Written instructional tests? Observation? Final examinations?
68. How are projects to be marked? Are students going to assist?
69. How is the course mark to be determined?
70. Are student projects to be exhibited? If so, when? Where?
71. Are you going to use textbooks and make assignments for out-of-class work?
72. What type of instruction sheets will be used? Workbooks? Study guides?
73. What type of training aids are you going to use (films, slides, charts, etc.)?
74. Is there sufficient blackboard space?
75. Is the bulletin board adequate?
76. Remove interest-destroying factors.
77. Are you going to utilize instruction material from commercial concerns?
78. Are you planning to take field trips with your students to business and commercial concerns?
79. Are you planning to invite business and industrial men to come to the shop and talk to the students?
80. What local, state, and national professional associations or clubs are there to which you should belong?
81. Subscribe to professional magazines and books. Much valuable information can be secured from them.
82. Is there sufficient storage space for completed and uncompleted projects to avoid damage and theft?
83. What is the student's responsibility in case of breakage of tools?
84. What is your responsibility in case of breakage or theft of tools and equipment?
85. Are you going to be held responsible for upkeep and repair of all tools and equipment?
86. How are tools going to be stored, checked, and issued?
87. How is the finishing room to be managed? How are materials going to be stored to prevent waste? Brushes cleaned and stored?
88. How will the glueroom be set up? What type of clamps will be needed? Type of glue?
89. Are there adequate facilities for students to wash after working in the shop?
90. How are acids to be stored?
91. Practice reasonable economy of material. Use salvaged material when feasible.
92. Are there appropriate metal and wire racks? Are there racks for short pieces of wire and metal so that they can be reached easily?
93. Is lumber stored or piled so as to prevent damage? Is there a rack for short pieces? *(Continued on page 46)*

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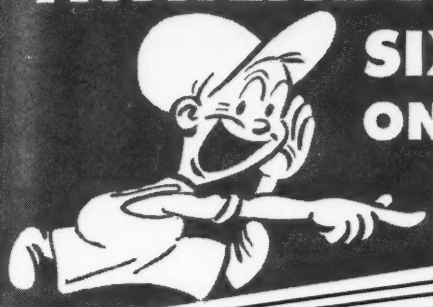

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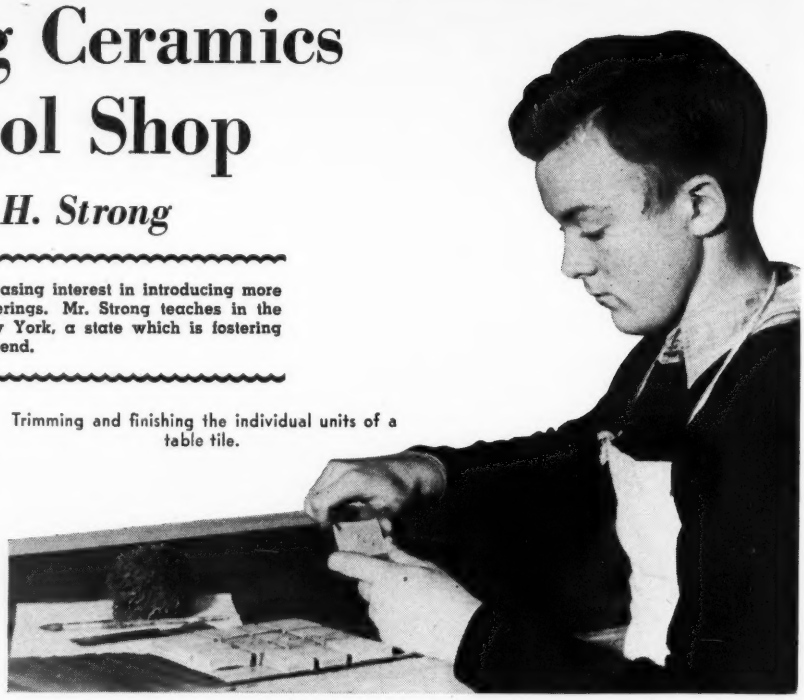
Introducing Ceramics in the School Shop

BY *Edgar H. Strong*

This article is evidence of the increasing interest in introducing more diversification in industrial-arts offerings. Mr. Strong teaches in the Geneva High School, Geneva, New York, a state which is fostering this trend.



Trimming and finishing the individual units of a table tile.

THE introduction of ceramics in the school shop will add to the industrial-arts program an activity which permits students to become acquainted with, and to acquire some skill in, one of the world's oldest crafts. The use of clay as a material and fire as a method of hardening is older than written history. The earliest historians made use of clay slabs or tablets to record their writings. These tablets, when subjected to fire, became imperishable and have come down to our time with their cuneiform inscriptions still legible. Primitive peoples of all parts of the world discovered for themselves or learned from others that clay in its plastic state could be used to form vessels and household utensils. They learned, probably by accident, that these vessels could be hardened by fire to make them durable and useful for the conveyance and storage of wet or dry materials. The formation of these articles required an unrefined, native, raw material and the simplest tools. The simplicity of the tools and the fundamental nature of the raw material used present one of the best arguments for the inclusion of ceramics in the school shop program.

"Setting" the kiln with ware which is to be "biscuit" fired.

The flexibility of the general-shop program allows the shop instructor to expand and enrich the program by the addition of whatever activities he believes will expose the students to the best overall view of industrial processes. The inclusion of ceramics in the program introduces an industrial field which in many areas is counted among the principal industries. It introduces a material which can be molded, cast, turned, extruded, and pressed. When confronted with the question of deciding whether to add this activity to the shop program, the instructor may hesitate because he feels that he lacks the knowledge and skill to handle properly the various ceramic processes and materials. This need not deter any instructor who is willing to experiment and who will be frank enough to let his students know that he is learning along with them.

Ceramic work offers a particularly valuable unit for enriching the general-shop program because it is practical, basically interesting, and inexpensive to carry on. Ceramic activity also offers an ideal medium for the teaching of applied design. The materials are cheap and easily procurable and, if your first attempt at designing with the material does not please you, you can start over again with the same material. Students should be encouraged to think out and execute original designs in whatever material they may be working with. Plastic clay allows a greater degree of freedom in design than any other of the commonly used materials. The finished product may not be beautiful when judged by professional standards but there will be a great deal of satisfaction in having a project that is all one's own. Each subsequent experience in creative design serves to make the next attempt more worthy. A piece of pottery formed with the fingers and simple tools from a shapeless mass of clay and hardened into a durable and practical product becomes more "your own" than a project made from any other commonly used material.

Work with the materials and processes used in the ceramic industry should be a part of the training of intelligent consumers of the products of industry. Every boy will, as in the case of wood, metal, and textiles, be a buyer and user of ceramic products. When it is considered that a listing of the products of the ceramic industry includes, in addition to pottery, dinnerware, glass, brick and tile, vitreous enamel, sanitary ware, and cement and gypsum products, one realizes how frequently students will meet these products as consumers.

Hand building is the logical beginning for ceramic work. The task of forming a piece of pottery from clay while using only the fingers as tools teaches the student a great deal about

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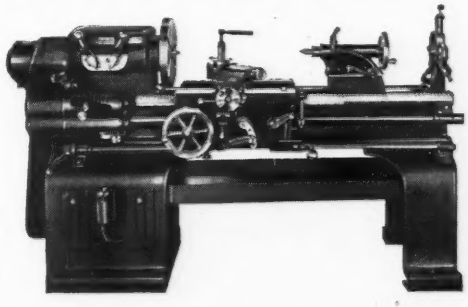

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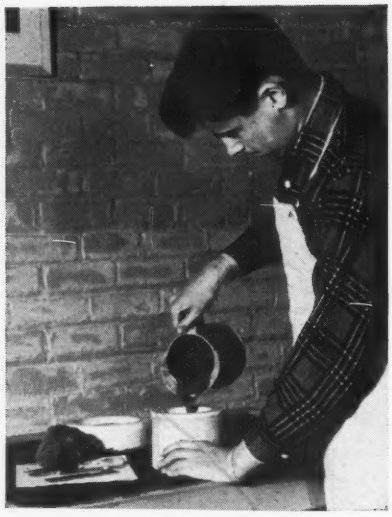

Pouring clay "slip" into a one-piece plaster mold.

the nature and behavior of the material with which he is about to work. He finds quickly that clay is a highly plastic material which responds to every touch of his fingers and tools. It is not necessary to continue long with this slow and tedious pottery process, but some experience with this primitive process teaches the student how to control this new material.

The making of plaster molds and the process of slip-casting pottery pieces in these molds is an interesting and practical operation. Casting and pressing in plaster molds is the forming process most used in industry since it permits the formation of a large number of identical pieces quickly and accurately. Once the mold is made, slip-casting is the easiest and quickest of the various forming processes. For this reason it is the process that must be most carefully controlled to prevent students from using it to produce quick results with the least amount of effort. One or two pieces cast in prepared molds will do much to stimulate interest in ceramic work, but after experimentation with the slip-casting process students should be encouraged to design and prepare their own molds.

Throwing on the potter's wheel is the most difficult of the ceramic forming processes. It is, however, a forming process that has been used since before the period of recorded history. No better way has been found for the shaping of individually designed pottery pieces. Students will find it very discouraging at first to be unable to center the clay on the wheel head, or to coax the clay into any semblance of form. It is a hand skill that requires a great deal of patience and practice. When the student has learned and developed the steps of centering, opening, raising, and shaping he will be able to produce pieces of pottery that have the individuality that only hand-thrown pottery can have. Work on the potter's wheel follows hand building as work on power tools follows the use of hand woodworking tools.

Since all of the plastic decorative processes require the use of modeling tools and technics, it is worthwhile to encourage experimentation with modeling. Modeling of human and animal forms is an activity that will appeal to only a few students. Most students will be frightened by their lack of skill and imagination and will hesitate to attempt this activity. To all who do attempt it, modeling offers a splendid medium for creative thought in design. A good substitute for the modeling of figures is abstract modeling in bas-relief on a plastic clay slab or tile. The design exercises modeled on a clay slab can be used to suggest modeled or carved designs on pottery pieces.

The amount and kind of equipment that is necessary to introduce ceramics in the school shop may range from minimum experimental equipment to complete and full-sized equipment sufficient to provide several weeks of class activity. The minimum equipment necessary to experiment with ceramics will consist of a small electric kiln, modeling tools, sponges, pans, pails, and measures. The materials will include plastic clay, plaster of Paris, and prepared glazes. With this equipment it is possible to start hand building of small pieces, modeling of small figures, preparation and use of small plaster molds for slip-casting, and experiment with the application of colored and colorless glazes to fired ware. This equipment will prove inadequate after the experimental stage has passed. All of the equipment can be used in the more fully developed ceramic unit which will follow this experimental start. The small electric kiln can be used as a test unit after the shop has been equipped with a larger kiln.

If ceramics is to be developed as a major unit of the general shop, it will be necessary to buy or build a kiln large enough to fire several pieces of pottery of practical size at each firing. While large kilns are difficult to buy at this time, materials are available for the construction of electric- or gas-fired kilns. Other necessary items of equipment are: metal sieves, ball mill jar with pebbles, spray equipment, modeling wheels, mortar and pestle, plaster

Finish turning a clay "hump" from which a one-piece plaster mold is to be made.

and clay turning tools, a potter's kick wheel, storage containers for materials, stoneware bowls for glazes, scales for weighing plaster and clay, and accurate balances for weighing glaze materials. The additional materials for expansion of the ceramic unit will include: a larger quantity of moist clay and plaster of Paris, china clay, ball clay, feldspar, flint, white lead, calcium oxide, zinc oxide, tin oxide, magnesium oxide, and the coloring oxides, iron, cobalt, copper, manganese, uranium, chrome, illemenite, and titanium.

With this more complete equipment it will be possible to hand-build larger pottery pieces, to prepare plaster moulds of practical size, to throw on the potters wheel, to weigh out, grind and apply glazes, and finally to fire and make permanent the products of the students' labors. The kiln of practical size will of course be the major item of equipment as far as cost is concerned. This cost is fully justified since none of the ceramic operations have any meaning or practical value unless they are followed by the firing process. A piece of pottery fashioned by hand or on the potter's wheel is only fragile clay until it is fired when it becomes a hard, glasslike substance of artistic and utilitarian merit.

There can be little question of the educational value of ceramics in the school shop program. It provides for the presentation of the basic materials and processes of the ceramic industry, the training of intelligent consumers of ceramic products, and the development of additional hand skills with new materials. The success of the ceramic unit depends on its development past the experimental stage to an activity where students will be able to produce full-sized, practical ceramic products.

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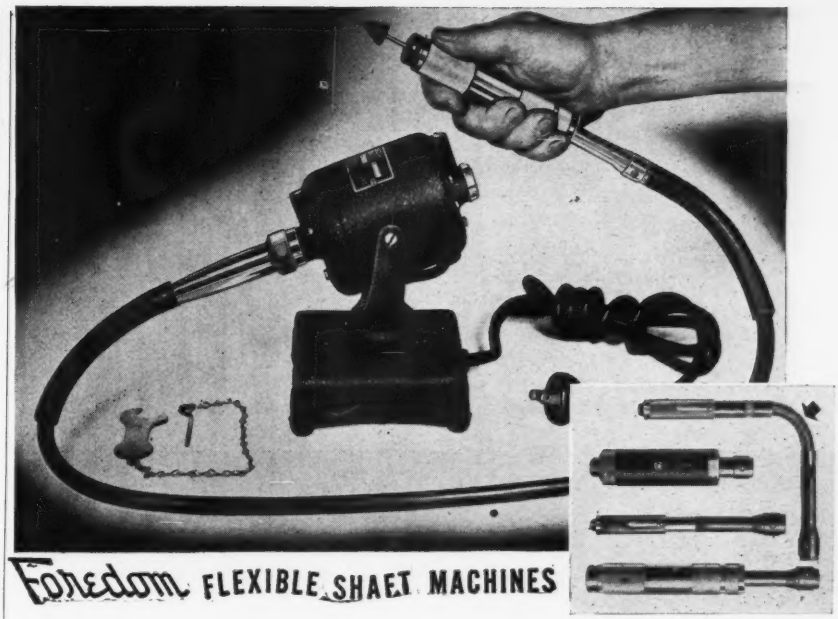

4 Quickly-interchangeable handpiece types—pencil size and larger —some with flexible wrist—see arrow.

STUDENTS learn *Faster* with practical *All-Purpose* FOREDOMS!

Teaching is easier and quicker when your shop courses include the practical instruction of Foredom Flexible Shaft Machines. These versatile all-purpose machines are used successfully in thousands of school shops and plants.

Pencil-size handpieces for the hard-to-reach places and larger ball-bearing handpieces for the heavier jobs are all quickly interchangeable. And flexible shafts which really ARE FLEXIBLE make Foredoms A-1 in efficiency. Because Foredom Machines are employed in so many large and small plants, your students will really benefit from their training with Foredoms when they start their shop careers.

For deburring, grinding, finishing, polishing and other light production jobs—particularly valuable on irregularly shaped parts.

3 WAYS *Right!*

1. For de-burring, grinding, finishing, polishing and other light production jobs—particularly valuable on irregularly-shaped parts.

2. In tool and die departments, for grinding, finishing and touching up dies, molds, jigs, etc.

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In die and tool departments, for grinding, finishing and touching up dies, molds, jigs, etc.

For maintenance and emergency needs—touching up set-ups without disassembly, removing high spots on gears, identification marking of equipment, etc.

THESE SHOP COURSES ALL USE FOREDOMS!

Machine Shop Practice, Automotive Mechanics, Aircraft Mechanics, Plastics, Tool and Die Making, Electrical, Radio, Dental Mechanics, Jewelry and Watchmaking, Model-Making, Woodcraft, etc.

THOUSANDS OF PLANTS USE FOREDOMS

including Ford, General Motors, Chrysler, Nash-Kelvinator, Jack & Heintz, Sperry Gyroscope, Bendix, Westinghouse, etc.

Send for Catalog No. 64, Showing Complete Line and Many Uses of Foredom Flexible Shaft Machines.

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Change

By a vote of the members, the name of the state association for industrial teachers in Iowa has been changed from the Iowa Industrial Arts Association to the Iowa Industrial Education Association. The new name was adopted to permit an expanded program for the association through participation of vocational industrial as well as industrial-arts teachers in organization activities. This follows a national trend in consolidating the state organizations of shop teachers. It is expected that the broadening of the base for membership will encourage greater participation by shop teachers in the professional organization. Officers of the new association are: president, R. T. Hening, Davenport; vice-president, Earl Kimball, Waterloo; and secretary-treasurer, Richard R. Kyl, Des Moines.

Safety

A SERIES of industrial safety charts is being distributed by the division of labor standards, U. S. Department of Labor. The charts, which depict work hazards and dangerous work practices, were privately prepared in collaboration with the division. Charts are already available on the following subjects: industrial trucks, engine lathes, band saws, abrasive wheels, shapers, ladders, and wrenches. Charts on electrical hazards, arc welding equipment, and screw drivers will be ready for distribution this fall. The charts are in two colors and are suitable for posting. Copies may be secured for five cents each from the Superintendent of Documents, Washington 25, D. C.

Farm Shop

TEACHERS of farm shop will be interested in the $37,500 agricultural award and scholarship program of the James F. Lincoln Arc Welding Foundation, Cleveland 1, Ohio. The purpose of the program is to encourage agricultural producers and educators to study the process of arc welding and to extend the scientific and practical development of this process to farm operation and maintenance by offering awards for papers and by giving scholarships in agricultural engineering. In the division of the program for persons in agricultural education and services there are 131 awards totaling $15,000 and 15 scholarships totaling $3,750. Closing date for the program is June 15, 1946. Rules and conditions may be secured from the above address.

Moving

ANNOUNCEMENT has been made of the moving of the branch office of the Kansas State Board for Vocational Education at Pittsburg to Topeka where it will be consolidated with the other departments of the state board. The move is planned to make for more efficiency in the operation of the distributive and trade and industrial education services which have been segregated from the main office.

Winners

WINNERS have been announced in the ninth annual essay contest sponsored jointly by the International Printing Ink Division of the Inter Chemical Corp. and the National Graphic Arts Education Association. First prize of a $500 War Bond went to Paul Broman of Central High School, Duluth, Minn. Sammy Shannon, Murphy High School, Mobile, Ala., won the second award of a $200 War Bond. Third prize, a $100 War Bond, was won by Henry N. Taylor, Groton School, Groton, Mass. The fourth prize of a $50 War Bond went to George E. Ehrlich, Weequahic High School, Newark, N. J. Fifth prize of a $25 War Bond was won by J. David Tregurtha, Central High School, Trenton, N. J. A total of 25 prizes of $5 in War Stamps was awarded to students throughout the United States.

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Sheldon Equipment for the School Shop has, in the past, set the standard for comparison. As we face the demands of a postwar era . . . an era which calls for greater progress and achievements . . . Sheldon planned equipment and Sheldon planned shops will continue to offer the maximum in utility and dependability.
What Sheldon Planning Engineers have accomplished for others is a dependable index of what can be done for you. Acquaint us with your shop needs and your planning problems . . . Sheldon Planning Engineers will be happy to work with you.
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● SKILSANDERS are light in weight, compact, perfectly balanced. They feel "just right." They're so simple to use that any student can produce a finer finish faster and easier on any flat surface of wood, metal or compositions.

And SKILSANDERS are rugged, dependable, quality-built throughout so they last longer and operate at lower cost . . . help you keep your budget in line.

Let your distributor show you on your own work why SKILSANDERS belong in your manual training shop. Phone him today for a demonstration.

SKILSANDERS are ideal for refinishing desks, blackboards and woodwork. They're preferred by industry everywhere for speed, economy and easy handling.

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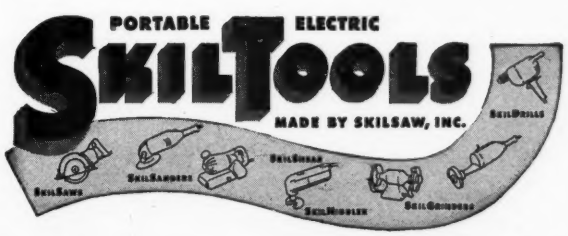

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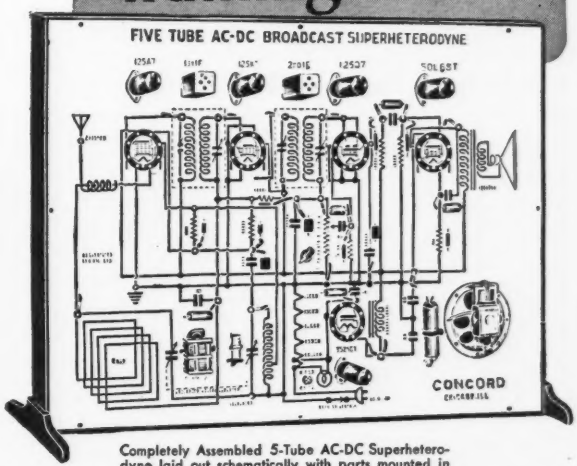

Completely Assembled 5-Tube AC-DC Superheterodyne laid out schematically with parts mounted in place and wired. Complete instructions included . . .
C.R.C.—81 . . . . . $57.50

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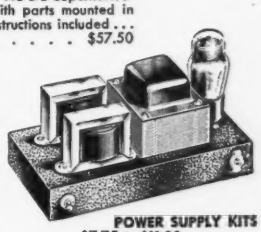
The coupon below will bring you full details—pictures, descriptions, prices, etc., about Concord Radio Training Kits and their importance to your radio instruction program. Mail the coupon now.



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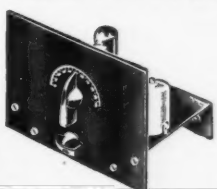

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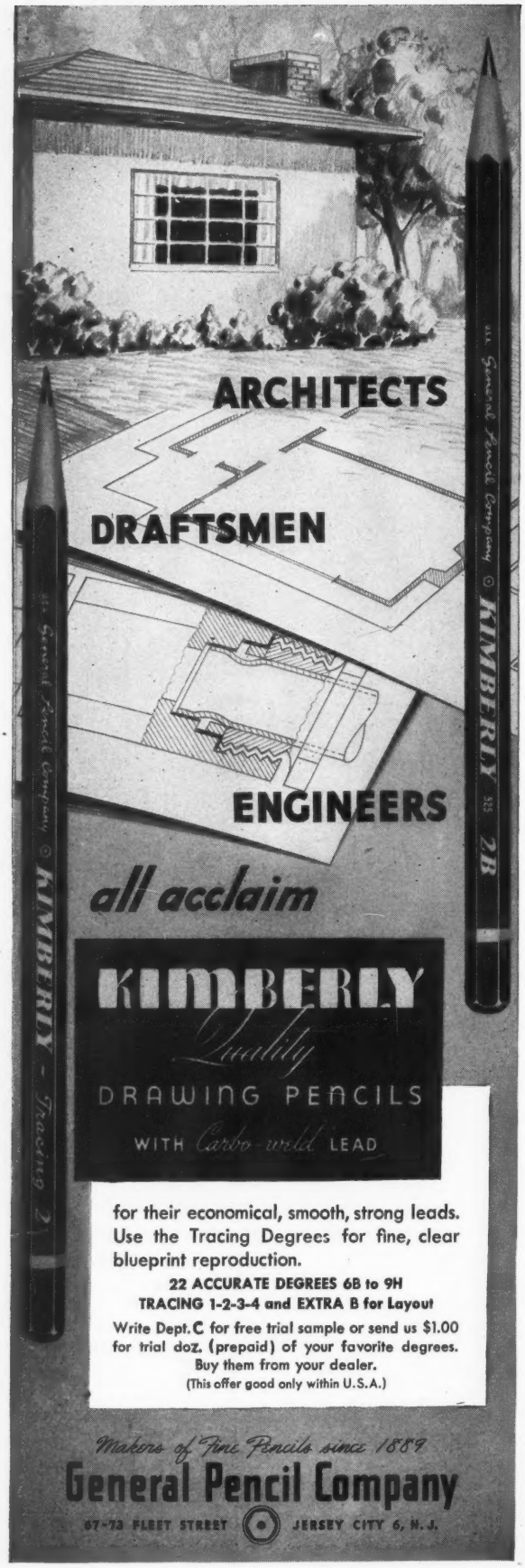
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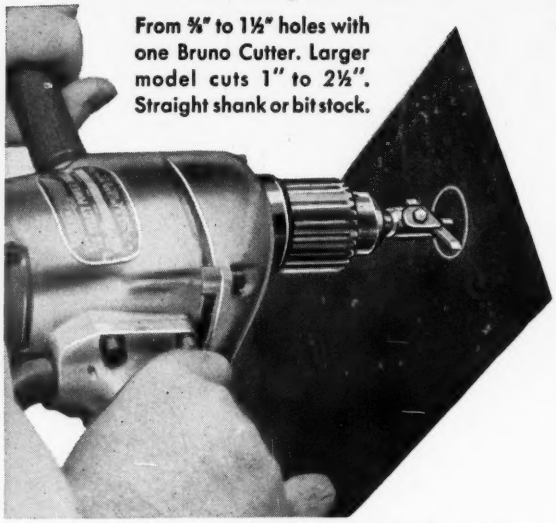

From ⅝" to 1½" holes with one Bruno Cutter. Larger model cuts 1" to 2½". Straight shank or bit stock.

Cuts Any Size Hole in METAL-WOOD-PLASTICS

In the shop or on the job, replace many fixed-radius cutters with Bruno. Makes clean, fast holes in sheet metal, boiler plate, light metal alloys, plywood, plastics, masonite, rubber, fibre and other materials. Easily and accurately set for any diameter in range of cutter.

Works well in Portable Drill, Hand Brace or Drill Press.

New uses every day for Bruno Cutters. High speed steel blade easily resharpened. Rugged construction. Designed by tool engineers. Ask your jobber, or write Bruno Tools, Beverly Hills, Calif., Dept. SS-9

Model No.	Shank Size	Cutter Expansion Capacity	User's Price
100	¼" straight shank	⅝"-1½"	$3.00
100-B	Square Bit Stock	⅝"-1½"	$3.00
101	⅜" straight shank	1"-2½"	$5.00
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No. 100 ⅝" to 1½"

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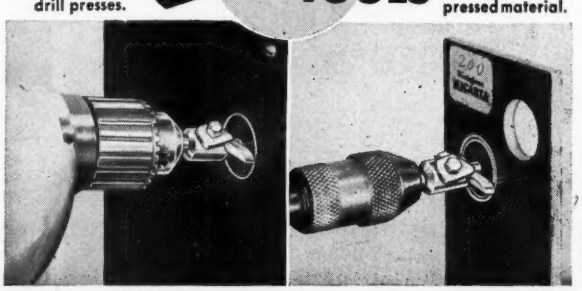
Ideal for electric drills and light drill presses.

BRUNO TOOLS

Cuts deep holes in wood or compressed material.



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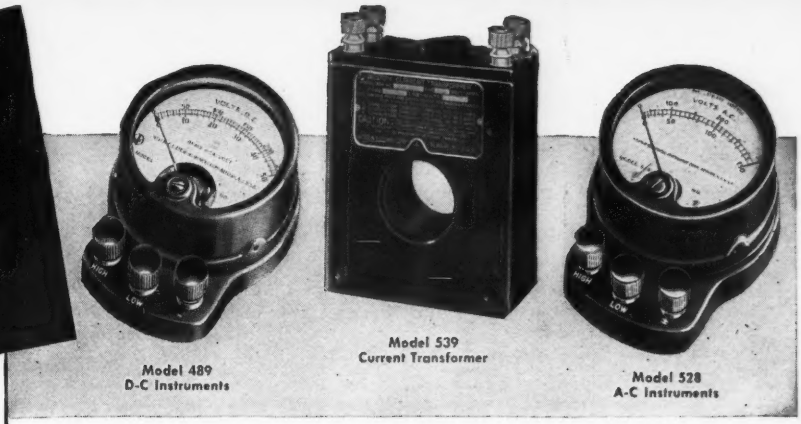

Model 489
D-C Instruments

Model 539
Current Transformer

Model 528
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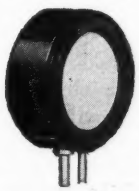
All-Metal Laboratory Thermometers — with easy to read dial — rugged all-metal construction — accuracy within ½ of 1% full scale.



Photronic (photo-electric) *Cells* — dry disc type cells of high output, famous for their stability.

Models 528 and 489 are companion lines, and are available as AC and DC Voltmeters, Ammeters, and Milliammeters, in single and double range instructions. Provide compactness, ruggedness and all-around serviceability.

Model 539 Current Transformer has four self-contained primary ranges of 2-5-10-20 amperes selected through a switch; with higher ranges by passing conductor through transformer. Has short circuiting switch for damage prevention.

While relatively low in cost, these instruments provide the precision and dependability necessary to teach students habits of exactness. Their ruggedness, too, makes them ideal for student use. Literature sent on request.

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"X-ACTO Knives Turn Work Into Fun," SAY STUDENTS— *"Fine Results Keep Students Interested,"* SAY TEACHERS

Schools Find Many Uses For Popular Craft Knife

Keen-edged as a surgeon's scalpel, easy to use as a pencil, X-acto is the ideal cutting tool to give confidence and skill to eager young handicrafters.

The handle holds firmly gives better cutting control. Saves spoilage, discouragement *and* cut fingers. A wide variety of blade shapes keeps X-acto *always sharp,* and always *ready* for the most difficult or delicate cutting job.

Schools discover new uses for X-acto every day, in art, craft, and science classes.

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Planes, ships, stages, etc. X-acto's the thing for difficult, hard to reach cuts.

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Favorite for cutting friskets, mats, stencils; also for patching, retouching photos.

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For wood, leather, plastics, X-acto cuts clean, smooth slits, slots, curves and angles.

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X-acto is perfect for dissecting work in biology. Also for botany and nature courses.

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Single knives, 50¢ to $1.50. Extra blades, in packages of 5 50¢. 3-Knife Sets in wooden chest with extra blades, $3.50 and $5.

Write on your school letterhead for catalog, sample offer and free copies of a series of helpful X-acto booklets.

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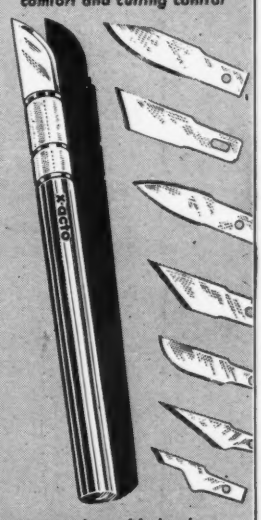
Bulldog-grip handle for comfort and cutting control



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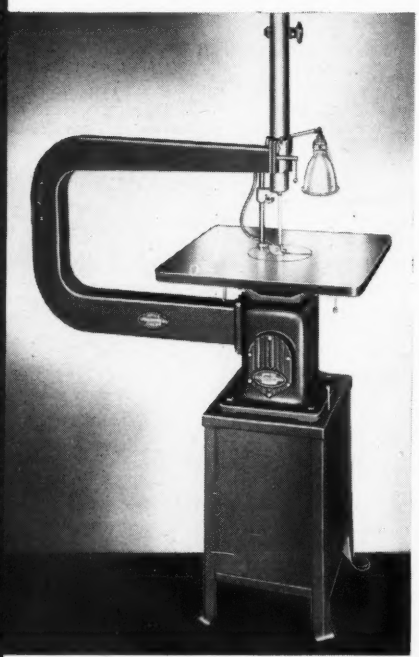
ABOUT YOUR FELLOW TEACHERS

LT. COL. VERNE C. FRYKLUND has returned to his post as professor of industrial education at the University of Minnesota after several years of service in the armed forces. . . . BURTON E. NELSON, president of Stout Institute, Menomonie, Wis., has announced his resignation to become effective September 15. He has served in the presidency for 23 years. . . . New officers of the Michigan Industrial Education Society are president, MAURICE PANCOST, principal, Lansing Technical High School, and vice-president, FRANK DALTON, University of Michigan. ARTHUR L. REAGH of Grand Rapids continues as executive secretary-treasurer. . . . LAURENCE PARKER, Kansas state supervisor of trade and industrial education, has resigned after 21 years of service to enter business. . . . New officers of the Vocational High School Teachers Association of New York City are HARRY LEWIS, president; BERTHA G. DAILEY, vice-president; WILLIAM P. NIGGE, corresponding secretary, MABLE E. GLESSON, recording secretary; and GEORGE W. HALL, treasurer. . . . ROBERT T. STONER, principal of the Pennsylvania State School of Aeronautics, Harrisburg, has been appointed chief of occupational information and guidance, Pennsylvania State Department of Public Instruction. . . . CHARLES W. MACLEAN, former supervising principal of the Locust Valley, L. I., N. Y., schools, has been appointed assistant director of the education department, Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa. . . . Veteran members of the faculty of Theodore Ahrens Trade High School who retired at the end of the school year are CHARLES P. MCGUIRE, teacher of bookbinding, and VINCENT B. SMITH, pressroom department head. . . . JOHN AMOS, director of vocational education, Hamtramck, Michigan, schools, has resigned to accept the position as director of vocational education at Jackson, Michigan. . . . JULIAN MCPHEE, California state director of vocational education and president of California Polytechnic College, has been named vice-president of the American Vocational Association, representing vocational agriculture. He replaces the late J. A. GUITTEAU. . . . GLEN D. BARKES, head of the industrial-arts department, Indiana University High School, Bloomington, has been named director of industrial education and industrial coordinator for the New Albany, Indiana, schools. . . . CARL E. KARLSTROM, supervisor of vocational education in the Detroit, Michigan, public schools and associate professor in Wayne University, died suddenly on June 14 at 56 years of age. . . . New officers of the Brooklyn, N. Y. Guild of Teachers of Shopwork are president, STANLEY A. WEBER; vice-president, CHARLES LYONS; recording secretary, WILLIAM WEITZ; corresponding secretary, LOUIS R. KRASSNER; financial secretary, WILLIAM DAVIS; treasurer, PHILIP WEISBARD; council representative, STACEY MANEY; and legislative representative, LOUIS R. KRASSNER. . . . JOHN R. KINGMAN, JR., treasurer of Dunwoody Institute, Minneapolis, Minn., has been named director, succeeding CHARLES ALLEN PROSSER who resigned at 73 years of age. . . . ERNEST W. CAMPBELL has been named assistant superintendent of the Seattle, Wash., schools to have charge of high schools and vocational and adult education. . . . THOMAS P. GARRITY has been appointed supervisor of trade and industrial education in the Detroit, Mich., schools to succeed the late CARL E. KARLSTROM.

BOICE-CRANE
Heavy Duty 24" x 5"
JIG SAW



Only jig saw with universal full-duty blade chucks that take most any type blades from 5" to 9" long. A distinctive Boice-Crane feature is its adaptability to light scroll work as well as heavy jig sawing up to 5" thick. Also does die filing, saber sawing, and sanding. Quickly adaptable for sanding and filing. Saws and sands metals, woods and plastics fast, clean, accurately and without vibration. Only the Boice-Crane has an oversize 20" x 20" highly polished, cast iron work table, two or three times more area and more support to your work. Tilts both ways 45 degrees. By removing U-frame and using sabre saws there is no limit to the size of panel that can be cut.

Rips 45-degree bevels on long lumber. Easier and quicker to set up and use.

Another outstanding Boice-Crane feature is the exclusive extra wide range calibrated tension control for correct spring-tension of every kind and size of blade, preventing breaking and damage, and guaranteeing longest life and straight cuts. Base is a heavy single iron casting.

Two long-wearing, widely spaced, fully lubricated bronze bearings accurately guide upper plunger and prevent blades sticking and breaking.

A complete, rugged, general purpose tool for contour and straight cuts, including inserted blade work impossible on a band saw.

Splash lubricated mechanism.

BOICE-CRANE POWER TOOLS

have been designed for ready adaptability to a wide range of projects. Thus, fewer machines are needed to meet all your requirements. Of just the right size for school shops, you can plan more efficient layouts, without the waste of floor space necessary with larger equipment.

With full realization that school shop equipment is frequently operated by inexperienced hands, every possible precaution has been taken to make Boice-Crane tools as nearly 100% safe as modern devices can make them. Furthermore, since occasional, if unintentional, abuse of tools by novices is inevitable, durability has been a first consideration in their construction. They can nobly "take a beating" which would incapacitate most machines.

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The G. I. Program Enables Schools to Do

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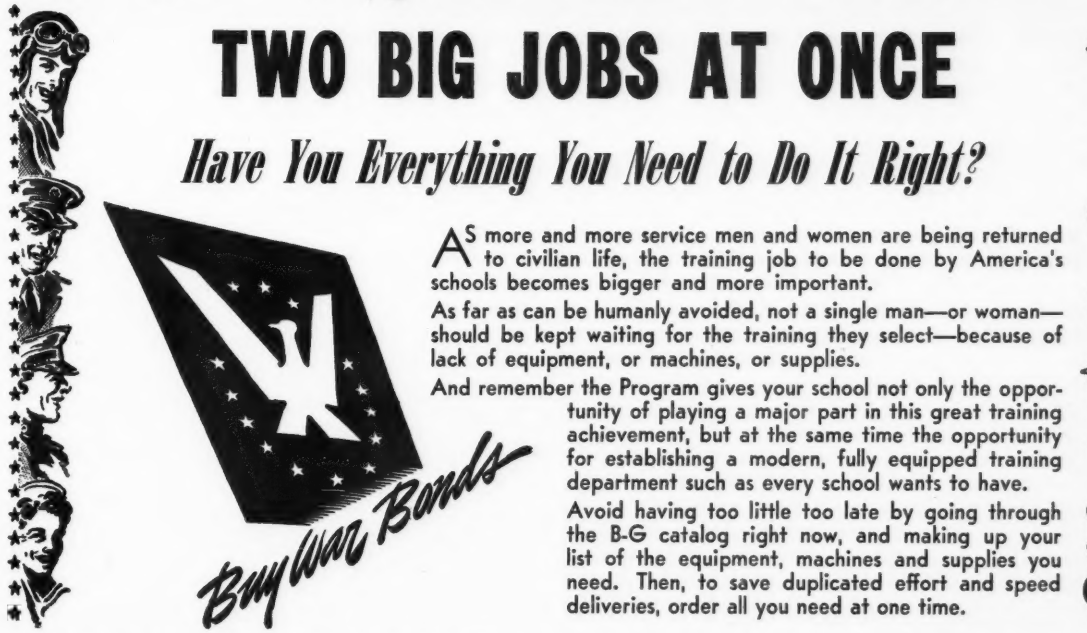

As more and more service men and women are being returned to civilian life, the training job to be done by America's schools becomes bigger and more important.

As far as can be humanly avoided, not a single man—or woman—should be kept waiting for the training they select—because of lack of equipment, or machines, or supplies.

And remember the Program gives your school not only the opportunity of playing a major part in this great training achievement, but at the same time the opportunity for establishing a modern, fully equipped training department such as every school wants to have.

Avoid having too little too late by going through the B-G catalog right now, and making up your list of the equipment, machines and supplies you need. Then, to save duplicated effort and speed deliveries, order all you need at one time.

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CLAMPMASTER—An **extra deep throat** speed clamp that positions instantly with push on combination ratchet screw (no waste motion running down screw) and tightens with turn of loose proof (rise-type) handle—holds work with firm tension grip on any surface, even slanting or irregular; ball and socket swivel (replaceable) prevents shifting or creeping. **Releases instantly**—simply loosen handle and push on trigger—clamp lifts free, ready for immediate application for any other size or thickness. All working parts **spatterproofed** with copper plating.

QUIKCET VISE—Can be set and closed, or opened in a jiffy. Simply push on body of free jaw which slides swiftly in on ratchet screw and precision guide rods, and tighten with a turn of loose-proof handle. Balanced precision grip holds firmly and evenly at all points between hardened serrated jaws that are integral with body casting. Opens instantly to full 3 inches by finger pressure on trigger release after single turn of loose-proof handle—ready without further adjustment for instant closing on any other work.

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News from INDUSTRY

Complete Set of Training Material on Industrial Electronics

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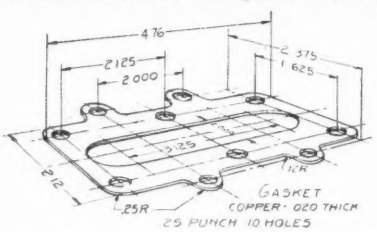
Mechanical Drawing Instructors Offered Excellent Blueprint Service



Joseph Dixon Crucible Company offers to the mechanical drawing teacher an interesting, highly instructive blueprint service.

First is given a blueprint reproduction of a problem to be solved by the students. This is followed by a blueprint of the solution, which the instructor gives to the student to compare with his own solution.

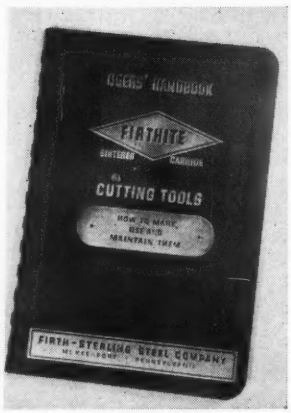
For instance, in the reproduction of the blueprint shown, the student is asked to draw the correct orthographic view of the gasket.

For complete details of this free service write to School Bureau, Pencil Sales Dept., Joseph Dixon Crucible Company, Jersey City, New Jersey, *or check No. 2 on the coupon.*

Handbook on Cutting Tools

Firth-Sterling Steel Company offers an important pocket handbook to shop teachers.

With machining practices revolutionized during the past five years through widespread contributions of powder metallurgy, this handbook provides the teacher with detailed instructions on the latest accepted uses of sintered carbides tools and dies. It gives instruction in making carbide tools, sets up rules for selecting grades of tips, and suggests ways to adapt by grinding general purpose tools for multiple purposes. Other sections deal with clearance and rake angles, chip control, hypermilling, care, and maintenance. Also included are charts on hardness conversion and metric conversion, as well as tables on the approximate cuts, feeds, and speeds for cutting steels, cast iron, etc.



For a free copy of this well illustrated, useful handbook write Firth-Sterling Steel Company, McKeesport, Pa., *or check No. 3 on the coupon below.*

A New Type "C" Clamp

A new type "C" clamp, known as the Grand ASL extra deep throat speed clamp, is announced by the Grand Specialties Company, Chicago. This new clamp incorporates many "quick-action" features. It can be positioned instantly by simply pushing down on the ratchet screw and tightening with a turn of the loose-proof handle. It can be released just as quickly by loosening the handle and pushing on the trigger release pawl which frees the ratchet screw.

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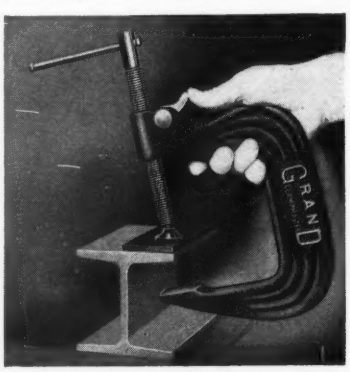

For complete details and prices of the three sizes of this new line of clamps write Grand Specialties Company, Grand Avenue at Troy, Chicago 22, Illinois, *or check No. 4 on the coupon below.*

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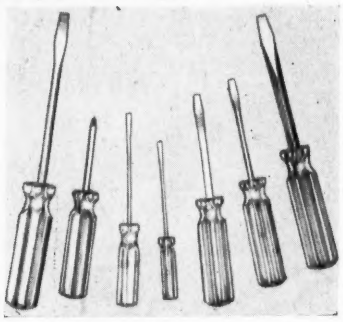

There are few more handy or important tools than screw drivers. Recognizing how imperative it is to have the right screw driver at hand in order to do a job properly and speedily, Vaco Products Company of Chicago has developed 173 different types of screw drivers covering every need.

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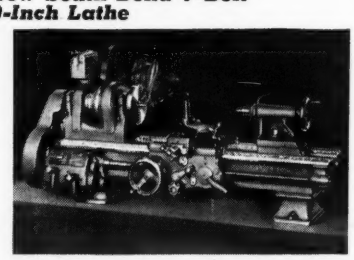

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All models have a 9¼" swing over the bed and saddle wings and ¾" headstock spindle hole with maximum collet capacity of ½". Choice of bed lengths gives distances up to 34" between centers.

Write the South Bend Lathe Works, 181 E. Madison St., South Bend 22, Ind., asking for Catalog 9-G, or *check No. 6 on the coupon.*

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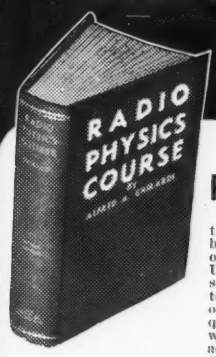

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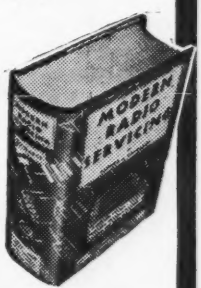

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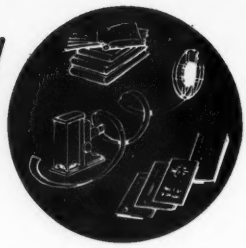

Aeronautical Instrument Projects. Walter B. Weber. Bloomington, Illinois: McKnight and McKnight, 1945. Pp. 124. $1.20

The purpose of this book is to bring to American youth a simplified and practical explanation of the many instruments that are a vital part of successful aviation. All the 25 projects in the book provide instruction and practice in building these instruments, and should help the student to fully understand the function and operation of each. All of the projects were prebuilt and tested for educational value before being included. There are 102 illustrations.

Walter B. Weber is instructor in aviation and electricity at the State Teachers College, Buffalo, New York.

Plastics, Third Edition. J. H Dubois. Chicago: American Technical Society, 1945. Pp. xiv + 447. $4.00.

This new, enlarged, third edition of one of the most popular books in its field contains many added features. In order to keep the book thoroughly modern, a new section has been added incorporating the latest developments in the field. This book now offers a full yet simplified presentation of the manufacture and use of the important plastics materials and products with tables of their properties, plus basic design information.

Formal chemistry is omitted, but in clear terms an explanation is given of what happens when various materials are handled by different methods in the production of plastics. Written primarily for the users of plastics, this book will serve as an excellent text, since it is written in a logical and easily understood manner. There are 214 illustrations and 52 tables.

J. H. Dubois is the executive engineer at the Shaw Insulator Company, Irvington, New Jersey.

Television Programming and Production. Hubbell. New York: Murray Hill Books, Inc., 1945. Pp. xii + 207. $3.00.

A new book of interest to everyone looking forward to television—and wondering about its postwar future. Of particular appeal to those contemplating television as a future profession because it not only reviews studio technic now in use, but anticipates advances in equipment and methods of the future.

The reader is taken first through the progress of television during the prewar period. Then the detailed potentialities of the art are discussed in a comparison of television with other mediums of entertainment and instruction. Finally, attention is centered on programming and production. Well illustrated with photographs and drawings.

Richard Hubbell was a member of the original television staff of the Columbia Broadcasting System. He is now production manager and television consultant for the Crosley Corporation, Broadcasting Division.

Training For Supervision in Industry. Fern. New York: McGraw-Hill Book Co., 1945. Pp. ix + 188. $2.00.

One of the latest in the McGraw-Hill industrial organization and management series, this book does not attempt to present an all-inclusive treatise on supervision. It does not treat the history nor the technical and economic phases of the subject. Rather, it is intended to give direct help to the supervisor with the problems of his daily job. This manual is concerned primarily with the responsibility of the supervisor as an instructor. It

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George H. Fern is director of civilian training, War Department, Washington, D. C.

Principles of Radio, Fifth Edition. Henney. New York: John Wiley & Sons, Inc., 1945 Pp. viii + 534. $3.50.

For years this text has been a popular choice for the study of elementary radio. Originally written to fit the needs of those with little or no background in radio, it has undergone many revisions in order to keep it abreast of the trends and new developments in a constantly changing field.

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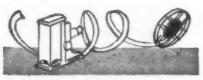
Keith Henney is the editor of *Electronics* and a Fellow of the Institute of Radio Engineers.



Architects' Visual Equipment Handbook, a recent booklet offered by the Bell and Howell Company, is designed to show architects, school boards, and others how to plan or adapt rooms for showing of motion pictures and other visual aids for instruction or entertainment. Among the subjects treated are seating arrangements, screen size and type, location of equipment, projected picture sizes obtained at various distances with various lenses, illumination and acoustics, projection booths, and other specifications. A copy of the booklet may be obtained without charge from Bell & Howell Co., 7100 McCormick Road, Chicago 45, Illinois. Please mention SCHOOL SHOP.

Projectionist Training is a new pamphlet recently published by the Victor Animatograph Corporation. It describes in detail the procedures used in the training of 16 mm. projectionists by the Army at Camp Hood. The Camp Hood experiment demonstrated that prospective operators should be chosen on the basis of three essential requirements: interest, reliability, and mechanical aptitude —interest being of primary importance. The pamphlet includes a simple questionnaire to test the prospective operator along with written tests given at the end of the instruction period. It also includes an outline of the course of instruction. A great help to the teacher who plans to train student projectionists. Available upon request to the Victor Animatograph Corp., Davenport, Iowa. Please mention SCHOOL SHOP.

The Milling Machine and Its Attachments, an 83-page booklet, has just been published by the Kearney and Trecker Corporation, Milwaukee. This is Book 2 in the Milling Practice Series being published by this company. It is divided into nine chapters covering the knee and bed types of milling machines, their attachments and their operation. Complete explanations and numerous illustrations make it a valuable aid in shop education and training. Available upon request to the Kearney & Trecker Corp., Milwaukee, Wisconsin. Please mention SCHOOL SHOP.

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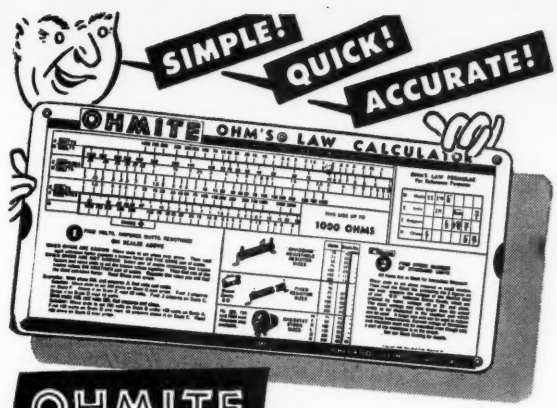

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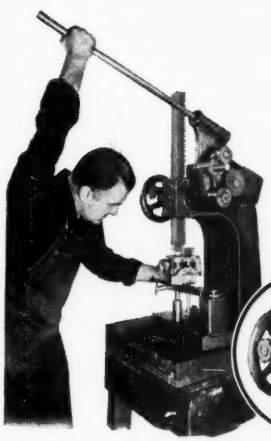

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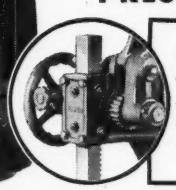

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Trade Training Given GI's in England

BY

Lt. Col. R. E. Kearney

The Army is going into vocational training for civilian occupations in a big way and will soon be operating one of the largest vocational schools in the world. Here is the set-up.

At a huge base air depot in England that has completed its wartime job, schoolbells will ring out this month for 4000 GI students who are going back to the classroom.

The depot, converted into one of the largest vocational schools ever established, a model institution where 20,000 men will eventually be trained, is situated in Warton, England, in the heart of the Midland industrial district. The students are men who have fought through the European campaign in every branch of the service and are now stationed at camps and posts throughout the European Theater.

The aim of the project, part of a fourfold educational program now under way in the European theater by the Information and Education Division headed by Brig. Gen. Paul W. Thompson, is to give the students the latest trends in the trade they once followed and which they plan to resume on return to civilian life.

The site of the Warton institution, known as the Theater Centralized Technical School, was selected because it offered central heating, modern buildings, good lighting, and other advantageous facilities. Here shop equipment with which the students will work is being installed by experts from Lockheed, General Motors, and other leading concerns. The equipment, as well as new trends and methods in various trades, includes much material that has not yet been released to the public in the United States.

Qualified Army personnel have been trained for teaching jobs at Information and Education staff schools that have been open since last October. Technical specialists have been recruited from colleges and universities, vocational schools, and leading industries throughout the United States, and have been sent to England as civilian instructors. Commandant of the Army's technical institute is Brig. Gen. Cyrus H. Searcy of Waco, Texas, an Infantry officer in the last war, and former chief of staff of the 8th Army Corps.

Because research surveys have shown that interest in these eight-week vocational courses will far surpass the accommodations of the school, special requirements have been made for the selection of the students. Enlisted men, warrant officers, and officers are eligible who have had civilian experience in the specific trade they wish to follow, either in school or in practical work, who show a definite aptitude for the course they elect, or who have had military schooling or military experience in their vocation. The students will be assigned on a quota basis from throughout the European Theater and, on completion of their eight weeks' of study, will return to their units.

Practical work will be the mainstay of the schooling schedule, which is based on a five-day work-and-study week. Two days of organized cultural and recreational activity will complete the schedule. Warton is not only in an industrial area, but is situated near Blackpool, a coastal resort, and many famed historic and scenic spots. Each of the 19 courses tentatively scheduled has been outlined into block units, and the entire scope of the individual course will be covered during the eight weeks. Each man may specialize in one mechanical trade. On satisfactory completion of the work, he will be given a certificate stating his degree of achievement and the extent of his studies. This record should prove to be of value not only to the student, but also to his future employer, or to the vocational school he may attend on return to civilian life.

As an example of the outlining of the individual courses, the class in Blueprint Production will follow four main topics. The first, "Blueprint Processing," will include use of the vacuum frame, arc lamps, making exposures, washing, chemical treating, use of the dryer, trimming with shears and Cuilliton type trimmer, and problems met in the operation of the continuous automatic printer.

The second phase will cover "Continuous Automatic Printer Operation," including the operation of the printer part in making exposures, operation of the washing and chemical treating part, operation of the drying part, continuous running of Van Dyke negatives and positives, and problems met in the entire process.

"Allied Reproduction Processes" will be taken into consideration next by the student, who will study the oxalid process, the direct black-and-white process, making Van Dyke prints, map mounting, and the reproduction of cloth tracings. The Blueprint Production course will close with classes devoted to "Maintenance and Repair of Equipment." This will include the repair and maintenance of the vacuum frame, arc lamps, motors, automatic printer, rotary-type dryer, washing tanks, rotary-type oxalid machine, and the direct black-and-white machine.

In a similar fashion, the course in carpentry will cover four units. These are, "Form Building," "Framing," "Finishing," and "Carpentry Mathematics." Since the GI students have, by admission requirement, learned the basic fundamentals of the trade they are taking up, the main stress in each class will be on advanced methods and discoveries rather than rudimentary teaching of the trade.

In addition to these two subjects, 17 others are scheduled on the curriculum. These are auto mechanics, heavy equipment operation and construction, electrical trade, machine-shop mechanics, engineering drawing, mechanical refrigeration, painting and decorating, cabinet making, welding, surveying, plumbing and heating, aircraft and engine repair, construction maintenance mechanics, radio repair, photography, printing, and instrument repair.

Warton is one of three schools operating under the direct supervision of the Information and Education Program. Universities at Shrivenham, England, and Biarritz, France, are offering a more general education at college level, including agriculture, commerce, education, engineering, fine arts, journalism, and the liberal arts. Like Warton, these are patterned on the eight-week "semester."

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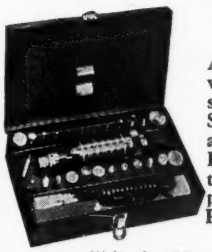

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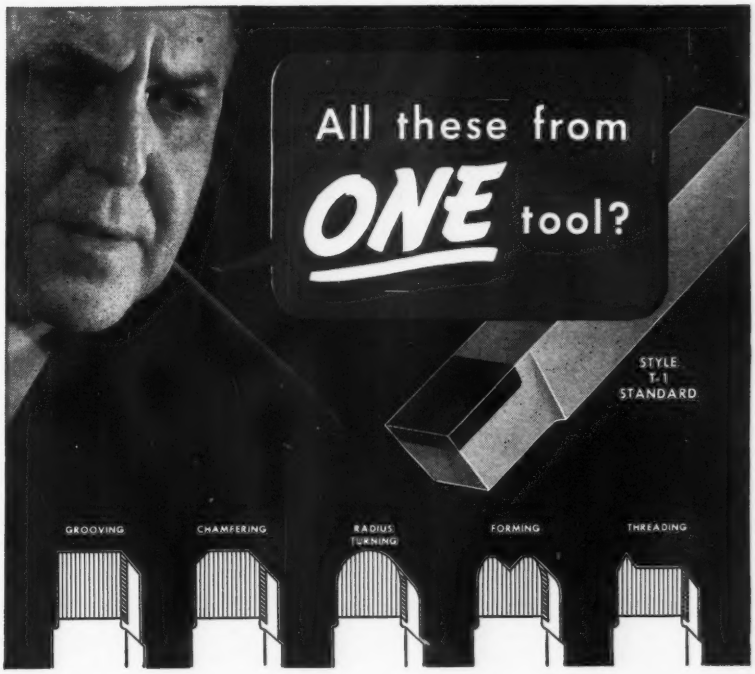

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The Editor, School Shop, Ann Arbor, Mich.

fromWashington...*from page 50*

any of the disposal agencies the school need only to write a letter to its nearest government surplus property office and describe its needs. The property in which schools are interested is handled primarily by the Department of Commerce and RFC.*

As a postscript, Washington officials add that there is nothing on the horizon indicating that surplus property will be available free to schools.

*For lists of regional offices, address the two agencies mentioned above at Washington 25, D. C. From RFC ask for a just published booklet called *How to Do Business with RFC.*

Starting Right . . . from page 20

94. Check general appearance of the shop. How can it be improved?
95. Check the location of safety and main switches.
96. Check gas lines for leaks.
97. Make a schedule for oiling machines. Caution students not to use linseed oil in place of lubricating oil.
98. Do not allow yourself to become the school fix-it-up man. Establish your policies regarding this at the beginning of the year.
99. Avoid saying uncomplimentary things about your predecessor or associates.
100. Keep a record of supplies and equipment to be ordered, machines to be repaired, jobs to be done, appointments to be kept, and information which you obtain at meetings. Keep a notebook in your pocket and jot down the items as they occur to you.

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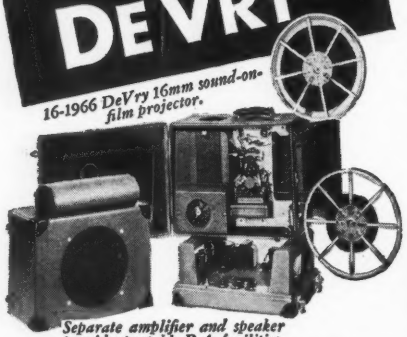

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16	6"	.16	1.76
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IN THE Morning Mail . .

[Brief comments about SCHOOL SHOP and the field it serves are invited. Address the Editor, SCHOOL SHOP, Ann Arbor, Michigan.

Gentlemen:

SCHOOL SHOP has become the recognized paper of all shop teachers. Each month I wait with great expectancy until I receive it. Yet this month (May) for the first time I am disappointed with it. I am not criticizing the content but the picture on the cover.

For years we schoolmen have battled to get trade education on the high plane it is today. It has been a long road, a highway strewn with misfits, morons, incorrigibles, and forsaken buildings. Yet today we stand on a promontory of that road, sheltered with the right type of school and peopled by bright, industrious students. We are not ashamed of our heritage. We haven't developed an inferiority complex from it. It was just a necessary evil we had to carry while wearing swaddling clothes.

If this cover picture was a replica of shop education of 20 years ago or a hill-billy school of today that we were trying to get rid of, it would be apropos.

Teachers of the modern, bread-winning type of education either wear overalls with a jumper or a business coat. At no time do they appear in shirt sleeves. Also, why preach safety first to a group that is allowed to wear torn, loose fitting aprons? One wouldn't have to look far to find a picture more truly representative of *trade* education.

JAMES E. MCKENZIE,
Seneca Vocational High School,
Buffalo, N. Y.

EDITOR'S NOTE: Oftentimes one has to look mighty far to find a shop teacher paying as much attention to safety education as is the man on the cover of the May issue. As for shirt sleeves or no shirt sleeves, whatever status is achieved by industrial education comes from quality of instruction and value of course content. Most important is what is happening in the mind of the student.

Gentlemen:

During February, 1944, I went to Fort Knox for service of an instructional nature with the Army. I have just returned to my work in the Industrial Education Department of the college here. We should like, of course, to receive again SCHOOL SHOP magazine which was much appreciated by the student group prior to my leaving Alpine.

VICTOR J. SMITH,
Professor of Industrial Education,
Sul Ross State Teachers College,
Alpine, Texas

EDITOR'S NOTE: Former servicemen returning to the shop teaching field are welcomed back on the SCHOOL SHOP mailing list. Just send our Circulation Department the name, school address, and specific subjects taught by such teachers and they will once again receive SCHOOL SHOP each month.

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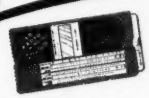

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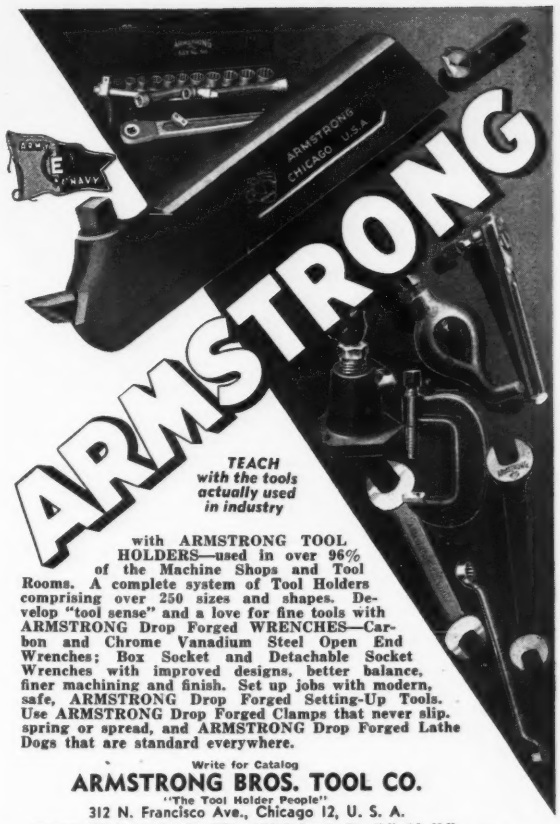

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FROM WASHINGTON

BY MICHAEL PACA

THROUGHOUT the Washington summer heat Congress worked on a half dozen or so major educational bills. But though it laid the foundation for the approval of all of them, not one was brought to completion.

Hence, when Congress comes back to town on October 8 it will have before it a roster of unfinished business. This it can rush through with comparative ease, if the votes are there.

● First to claim Congressional attention in October will probably be a revision of the G. I. Bill of Rights and its training provisions. The House has already approved amendments which would increase slightly the subsistence pay of school-going veterans. The amendments, sponsored by Rep. Rankin of Mississippi, would also permit a veteran to begin his schooling at anytime within four years after his discharge instead of two, as now provided, and would continue the entire training program for nine years after the end of the war instead of seven.

The Senate adjourned before acting on these amendments. But when it reconvenes it is expected to broaden and liberalize them. Immediately before recess, Senators were presented by Senator Pepper of Florida with a long list of proposed amendments. These would increase subsistence pay up to $150 per month for a veteran with dependents, wipe out all age restrictions, and liberalize time limits for beginning and ending the training.

At least two of the amendments proposed by Senator Pepper will cause considerable debate in Congress. One would *require* the Veterans Administrator to arrange for vocational counseling, instead of only empowering him to do so if he sees fit. The other would amend the ill-famed Section 1505 of the G. I. Bill of Rights so that schooling benefits would not be deducted from any bonuses which Congress may vote veterans in the future. Section 1505 has been blamed by many educators for discouraging veterans from enrolling in schools and colleges.

● Left unfinished by Congress during the summer, but which is to be among the first times on the fall agenda, is the school lunch program. After long hearings, the House and Senate Committees have given their approval to a permanent school lunch system for the United States. Equally important is the fact that the U. S. Office of Education and the Department of Agriculture have also ironed out their differences. As a result, there is a good chance that the revolutionary plan of feeding children at federal expense will at last become a permanent part of our school systems.

● Hearings have also been completed on the bills designed to expand all branches of vocational education (S. 619) and to authorize funds for federal aid to education. These measures are ready for debate and final approval, if Congress sees fit to do so. Awaiting decision is also the compulsory military training issue. After extended hearings on this proposal, the House Postwar Military Policy Committee came out with an endorsement for universal military training for young men. With this action, the Congressmen marked the opening of what will develop into one of the really great public debates of this generation.

● Newcomer on the Washington legislative scene is the High School Science Education Bill (S. 1316). This measure proposes an eventual outlay (by 1950) of $20,000,000 to improve instruction in aviation, radio, "earth sciences," and other scientific subjects. Senator Thomas of Utah said he introduced this bill because "training in natural sciences is of vital importance in many occupational fields, yet the war has disclosed a widespread lack of opportunity for youth enrolled in public secondary schools to receive effective instruction in natural science subjects."

● Schools are not yet doing business with the Surplus Property Board in any large volume. Such is the complaint of officials who have to dispose of billions of dollars worth of surplus property.

The Reconstruction Finance Corporation (the agency in charge of disposing "heavy goods") says that only 35 airplanes have been sold to schools so far. Thousands of aircraft are available, many at ten dollars ($10.00) each!

Surplus property officials do not try to explain this disinterest on the part of schools. They only point to these facts: that war agencies are continually declaring valuable items as surplus; that prices are about one-fourth of the original cost and, in the case of aircraft, the prices cover only the cost of crating; and that to begin doing business with

(Continued on page 46)

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